Appendix J

Estimated Costs, Proposed Projects

Table J-1 Estimated Costs of Distribution Reservoirs

Project	Reservoir ID	Reservoir Name	V4 at: Reservoir ID	Vol 1	Vol 2	Vol 3	Vol 4	Required Vol	New Vol	Existing Volume	Demand 2030 (m3/h)	Estimated Cost, $
East System	ZS01MA-1	Zatary		474	790	6,152	713	8,129		10,000	66	
East System	HO01IR-1	Hofa				5,070	4,503	9,573		17,000	-	
East System Total												
West	WS01IR	Zubdat		19,908	62,883	6,190		88,981		110,000	2,765	
West System Total												**-**
Wehdah	WE-PS2	Wehdeh PS2					3,850	3,850	4,000			712,246
Wehdah System Total												**712,246**
Upper Aqeb Mafraq	MA01MA-1	Mafraq		3,888	6,480	1,888	307	12,563	13,000		540	1,487,844
Upper Aqeb Mafraq	MA02MA-1	Hayan	MA01MA-1	300	500	83		883	1,000		42	299,463
Upper Aqeb Mafraq	MA05MA-1	Balama	MA01MA-1	744	1,240	207		2,191	2,500		103	530,952
Upper Aqeb Mafraq	MA06MA-1	Zniyya		192	320	53		565	750		27	250,182
Upper Aqeb Mafraq	MA07MA-1	Mazraa		360	600	100		1,060	1,000		50	299,463
Upper Aqeb Mafraq	MA03MA-1	Moammariyyeh	MA01MA-1	210	350	713	1,310	2,583	2,500		29	530,952
Upper Aqeb Mafraq	MA04MA-1	Humaid	MA03MA-1	36	60			96		130	5	
Upper Aqeb Mafraq	UL21JE-1	Jerash Up	MA03MA-1	906	1,510			2,416	2,500		126	530,952
Upper Aqeb Mafraq	UL22JE-1	Souf Refugee	MA03MA-1	846	1,410			2,256	1,500	750	118	385,833
Upper Aqeb Mafraq	UL23JE-1	Jerash Down	MA03MA-1	1,350	2,250	267		3,867	4,000		188	712,246
Upper Aqeb Mafraq	UL25JE-1	Nabi Houd	MA03MA-1	300	500	68	70	938	1,000		42	299,463
Upper Aqeb Mafraq	UL24JE-1	Rashadiyeh	UL25JE-1	126	210			336	350		18	155,377
Upper Aqeb Mafraq System Total												**5,482,727**
Sumaya/Khaldiya	ZS03MA-1	Sarhan		1,140	1,900	317		3,357	4,000		158	712,246
Sumaya/Khaldiya	ZS06MA-1	Khaldiyeh		1,512	2,520	420		4,452	5,000		210	818,840
Sumaya/Khaldiya	ZS05MA-1	Swaylima		132	220	37		389	500		18	194,178
Sumaya/Khaldiya	ZS04MA-1	Hamra		618	1,030	172		1,820	2,000		86	461,835
Sumaya/Khaldiya	ZS02MA-1	Baij	ZS01MA-1	732	1,220	203		2,155	2,000		102	461,835
Sumaya/Khaldiya	ZS07MA-1	Thughrat Al Jubb	ZS01MA-1	174	290	48		512	500		24	194,178
Sumaya/Khaldiya System Total												**2,843,111**
Um El Lulu	UL01MA-1	Um El Lulu	ZS01MA-1	372	620	1,357	983	3,332	3,000	550	52	595,036
Um El Lulu	UL02MA-1	Um An Naam	UL01MA-1	288	480	80		848	1,000		40	299,463
Um El Lulu	UL03MA-1	Bani Hasan	UL01MA-1	642	1,070	178		1,890	2,000		89	461,835
Um El Lulu	UL04MA-1	Bwaydah PS	UL01MA-1	72	120	82	123	397	500		10	194,178
Um El Lulu	UL06MA-1	Qadam	UL04MA-1	288	480	45		813	350	500	40	155,377
Um El Lulu	UL11MA-1	Hamama	UL04MA-1	96	160			256	250		13	125,909
Um El Lulu	UL07MA-1	Dajanyeh	UL01MA-1	210	350	58		618	750		29	250,182
Um El Lulu	UL08JE-1	Abu Eiat	UL01MA-1	186	310	752	1,013	2,261	2,000	500	26	461,835
Um El Lulu	UL12MA-1	Midawar	UL08JE-1	114	190	30		334	350		16	155,377
Um El Lulu	UL13MA-1	Nadira	UL08JE-1	156	260			416	500		22	194,178
Um El Lulu	UL14JE-1	Majar	UL08JE-1	234	390			624	750		33	250,182
Um El Lulu	UL15JE-1	Deir Al Liyyat	UL08JE-1	204	340			544	750		28	250,182

Project	Reservoir ID	Reservoir Name	V4 at: Reservoir ID	Vol 1	Vol 2	Vol 3	Vol 4	Required Vol	New Vol	Existing Volume	Demand 2030 (m3/h)	Estimated Cost, $
Um El Lulu	UL16JE-1	Ketteh	UL08JE-1	600	1,000		387	1,987	2,000		83	461,835
Um El Lulu	UL17JE-1	Gaza Camp	UL16JE-1	1,338	2,230	178		3,746	4,000		186	712,246
Um El Lulu	UL18JE-1	Nahleh	UL08JE-1	36	60			96	100		5	71,014
Um El Lulu	UL19JE-1	Burma Up	UL18JE-1	180	300			480	500		25	194,178
Um El Lulu	UL20JE-1	Burma Down	UL18JE-1	408	680			1,088	1,000		57	299,463
Um El Lulu	UL09JE-1	Balila	UL01MA-1	360	600	100		1,060	1,000		50	299,463
Um El Lulu	UL10BO-1	No'aymeh	UL01MA-1	414	690	115		1,219	1,500		58	385,833
Um El Lulu System Total												**5,817,763**
Hofa	DS04IR-1	Beit Yafa	HO01IR-1	1,370	2,283			3,653	4,000		190	712,246
Hofa	DS09AK-1	Kufr Kifya		47	79	13		140	150		7	91,496
Hofa	DS19AJ-1	Kofranjeh Up	HO10IR-1	653	1,088	95		1,836	2,000		91	461,835
Hofa	HO02BO-1	Sarih	HO01IR-1	1,322	2,203			3,525	4,000		184	712,246
Hofa	HO03BO-1	Huson	HO01IR-1	2,571		714		3,285	4,000		357	712,246
Hofa	HO04IR-1	Ham	HO01IR-1	1,510	2,517			4,027	4,000		210	712,246
Hofa	HO05IR-1	Juhfiyya	HO01IR-1	471	785	131		1,386	1,500		65	385,833
Hofa	HO06IR-1	Habka	HO01IR-1	221	368	61		650	1,000		31	299,463
Hofa	HO07IR-1	Al Mazar		806	1,343	224		2,373	2,000		112	461,835
Hofa	HO08IR-1	Samad	HO01IR-1	809	1,348	3,043	1,380	6,580	7,000		112	1,010,483
Hofa	HO09BO-1	Shatana	HO08IR-1	778	1,296			2,074	2,000		108	461,835
Hofa	HO10IR-1	A'seem	HO08IR-1	879	1,465	1,117	1,743	5,204	5,000		122	818,840
Hofa	HO11AJ-1	Rasoun	HO10IR-1	169	282	10		460	500		23	194,178
Hofa	HO12AK-1	Judyta up	HO10IR-1	733	1,221			1,954	2,000		102	461,835
Hofa	HO14AJ-1	Arjan		344	573	95		1,012	1,000		48	299,463
Hofa	HO15AJ-1	Ba'oon		366	610	102		1,078	1,000		51	299,463
Hofa	HO16AJ-1	Ishtafina	HO10IR-1	78	130			208	250		11	125,909
Hofa	HO17AJ-1	Ein Jana	HO10IR-1	649	1,082	18		1,749	2,000		90	461,835
Hofa	HO18AJ-1	Ajloun	HO10IR-1	573	955			1,527	1,500		80	385,833
Hofa	HO19AJ-1	Anjarah Down	HO10IR-1	726	1,211			1,937	2,000		101	461,835
Hofa	HO20JE-1	Mazraat Eshkarah		52	87	15		154	150		7	91,496
Hofa	HO21JE-1	Al Jabal Al Akhdar	HO34AJ-1	59	98			156	150		8	91,496
Hofa	HO22AJ-1	Rajib	HO34AJ-1	155	258	13		425	500		21	194,178
Hofa	HO23JE-1	Hooneh	HO34AJ-1	83	138			220	250		11	125,909
Hofa	HO24AJ-1	Ras Muneef	HO08IR-1	820	1,367	1,485	2,147	5,819		6,300	114	
Hofa	HO25AJ-1	Sakhra	HO24AJ-1	718	1,196		227	2,140	2,000		100	461,835
Hofa	HO26JE-1	Kufr Khal	HO25AJ-1	407	679			1,086	1,000		57	299,463
Hofa	HO27JE-1	Thughrat Asfoor	HO24AJ-1	11	18			28	100		1	71,014
Hofa	HO28JE-1	Muqbla	HO24AJ-1	151	252			403	500		21	194,178
Hofa	HO29JE-1	Qafqafa	HO24AJ-1	334	556			890	1,000		46	299,463
Hofa	HO30JE-1	Souf Down	HO24AJ-1	564	941	67		1,571	1,500		78	385,833
Hofa	HO31JE-1	Souf Up	HO24AJ-1	327	545			872	1,000		45	299,463

Project	Reservoir ID	Reservoir Name	V4 at: Reservoir ID	Vol 1	Vol 2	Vol 3	Vol 4	Required Vol	New Vol	Existing Volume	Demand 2030 (m3/h)	Estimated Cost, $
Hofa	HO32JE-1	Raymun	HO24AJ-1	421	701			1,122	1,000		58	299,463
Hofa	HO33JE-1	Sakib	HO24AJ-1	726	1,210			1,936	2,000		101	461,835
Hofa	HO34AJ-1	Anjarah up	HO24AJ-1	726	1,211		140	2,077	2,000		101	461,835
Hofa	HO35JE-1	Al-Husayniyyat	HO24AJ-1	121	202			322		675	17	
Hofa System Total												**13,268,416**
Bani Kinana Ramtha	ES01RA-1	Bwaydah-Ramtha	ZS01MA-1	348	580	97		1,025	1,000		48	299,463
Bani Kinana Ramtha	ES02RA-1	Ramtha JUST	ZS01MA-1	192	320	53		565	500		27	194,178
Bani Kinana Ramtha	KR01BK-1	Sama Ar Rousan	WE-PS2	2,457		1,363	1,360	5,181	5,000		341	818,840
Bani Kinana Ramtha	KR02BK-1	Abder	KR01BK-1	2,447				2,447	3,000		340	595,036
Bani Kinana Ramtha	KR03IR-1	Beit Ras	WE-PS2	1,341		372		1,713	2,000		186	461,835
Bani Kinana Ramtha	KR04IR-1	Fou'ara	WE-PS2	506		141		647	1,000		70	299,463
Bani Kinana Ramtha	KR05IR-1	Sal	WE-PS2	2,566		713		3,279	3,000		356	595,036
Bani Kinana Ramtha	KR06RA-1	Ramtha City	WE-PS2	4,209		1,577	813	6,599	7,000		585	1,010,483
Bani Kinana Ramtha	KR07RA-1	Al Toura	KR06RA-1	2,229		213		2,443	3,000		310	595,036
Bani Kinana Ramtha System Total												**4,869,369**
Deir As Sina	DS01IR-1	Qumaym	WA-PS3	1,783	2,972	772	553	6,079	6,000		248	917,672
Deir As Sina	DS02IR-1	Soum	DS01IR-1	1,310	2,183	363		3,856	4,000		182	712,246
Deir As Sina	DS03IR-1	Deir As Sina	WA-PS3	544	906	151		1,601	1,500		76	385,833
Deir As Sina	DS05IR-1	Taybeh	WA-PS3	748	1,247	208		2,203	2,000		104	461,835
Deir As Sina	DS06IR-1	Mindah	WA-PS3	783	1,305	40		2,127	2,000		109	461,835
Deir As Sina	DS07AK-1	Jinnin	WA-PS3	265	442	257	367	1,330	1,500		37	385,833
Deir As Sina	DS08AK-1	Ezimal	DS07AK-1	661	1,102	184		1,947	2,000		92	461,835
Deir As Sina	DS10AK-1	Tubneh		373	621	104		1,097	1,000		52	299,463
Deir As Sina	DS11AK-1	Deir Abi Said		1,149	1,915	319		3,383	4,000		160	712,246
Deir As Sina	DS12AK-1	Kufr Alma	WA-PS3	642	1,070	867	1,377	3,955	4,000		89	712,246
Deir As Sina	DS13AK-1	Ashrafiyya Low	DS12AK-1	413	689	115		1,216	1,500		57	385,833
Deir As Sina	DS14AK-1	Ashrafiyya high	DS12AK-1	1,011	1,686	281		2,978	3,000		140	595,036
Deir As Sina	DS15AK-1	Kufr Awan	DS12AK-1	909	1,516	253		2,677	3,000		126	595,036
Deir As Sina	DS16AJ-1	Al-Hashimiyya	DS12AK-1	814	1,356	226		2,396	3,000		113	595,036
Deir As Sina	DS17AJ-1	Deir Smadiyyeh	DS12AK-1	351	585	97		1,033	1,000		49	299,463
Deir As Sina	DS18AJ-1	Kofanjeh Down	DS12AK-1	837	1,395	233		2,465	1,500	1,000	116	385,833
Deir As Sina	HO13AK-1	Judyta down		134	224	37		396	500		19	194,178
Deir As Sina	WA-PS3	Wadi Al Arab PS3				4,667	2,333	7,000	6,000	1,700		917,672
Deir As Sina System Total												**9,479,131**
Total Cost, $												**42,472,763**

Notes:

*		V2 of the concerned reservoirs has been considered in the existing Zabda reservoir
**		The reservoir containing V4

Table J-2 Estimated Costs of Pipelines

Systems	Diameter, mm	Length, m			Cost, $
		Existing	New	Total	
East System	500	8,112		8,112	-
	600	49,117	104	49,221	31,389
	700		25,979	25,979	9,664,037
	900		6,931	6,931	3,721,979
	1000		15,064	15,064	9,294,254
East System Total		**57,229**	**48,078**	**105,306**	**22,711,659**
West System	600	32,908		32,908	-
	800	23,002		23,002	-
West Total		**55,910**		**55,910**	**-**
Wehda	1000		18,619	18,619	11,487,860
	1100		10,104	10,104	7,133,124
Wehdeh System Total			**28,722**	**28,722**	**18,620,984**
Corridor	500	9,092		9,092	-
	600	6,763	21,479	28,242	6,465,208
Corridor Total		**15,855**	**21,479**	**37,335**	**6,465,208**
Sumaya Khaldiyeh Zatary	100		11,531	11,531	703,361
	150	22,560	12,589	35,149	956,793
	200	1,912	10,240	12,152	962,548
	250		1,591	1,591	179,728
	300	2,929	1,659	4,588	222,284
	400	7,796		7,796	-
	500	18,714		18,714	-
	600	10,891		10,891	-
	1000		10	10	6,028
Sumaya Khaldiyeh Zatary Total		**64,802**	**37,619**	**102,421**	**3,030,741**
Upper Aqeb Mafraq	100		3,942	3,942	240,469
	150		6,243	6,243	474,493
	200		25,089	25,089	2,358,396
	300	2,527	13,927	16,454	1,866,201
	400		52,889	52,889	9,625,866
	500	5,181	11,773	16,954	2,802,074
	600	14,906	1,190	16,096	358,211
	700		20,699	20,699	7,700,162
Upper Aqeb Mafraq Total		**22,614**	**135,754**	**158,368**	**25,425,872**
Um El Lulu	100		12,922	12,922	788,213
	150	10,637	14,448	25,086	1,098,074
	200	2,699	17,865	20,564	1,679,325
	300	6,792	13,772	20,563	1,845,399
	400		24,598	24,598	4,476,927
	500		12,515	12,515	2,978,663
Um El Lulu Total		**20,128**	**96,121**	**116,248**	**12,866,600**
Hofa	100		19,047	19,047	1,161,895
	150	20,624	16,118	36,741	1,224,935
	200	8,567	31,311	39,878	2,943,237
	250		14,515	14,515	1,640,176
	300	1,646	20,584	22,230	2,758,261
	400	16,608	26,699	43,306	4,859,160
	500		7,461	7,461	1,775,711
	800		9,438	9,438	4,247,096
	1000		11	11	6,485
Hofa Total		**47,445**	**145,183**	**192,628**	**20,616,955**
Bani Kinana Ramtha	100		2,345	2,345	143,017
	150	1,389	7,458	8,848	566,827
	200		514	514	48,296
	300	3,467	9,370	12,836	1,255,536
	400	5,206	16,580	21,786	3,017,548
	500		9,170	9,170	2,182,510
Bani Kinana Ramtha Total		**10,062**	**45,436**	**55,499**	**7,213,735**
Deir As Sina	100		3,348	3,348	204,214
	150	4,189	6,733	10,922	511,728
	200	4,940	11,561	16,501	1,086,761
	250		849	849	95,932
	300		34,083	34,083	4,567,097
	400		18,778	18,778	3,417,609
	500		8,073	8,073	1,921,365
Deir As Sina Total		**9,129**	**83,425**	**92,554**	**11,804,705**
Grand Total		**303,173**	**641,817**	**944,990**	**128,756,460**

Table J-3 Estimated Cost of Pump Stations

Project	Pump Station ID	PUMP-STATUS	Pump Station Name	REQUIRED PUMP SET					
EAST SYSTEM				**Q(m3/h)**	**H(m)**	**DESTINATION**	**COST $**	**POWER KW**	**POWER COST $**
	E1	NEW	ZATARY	2170	221	TO UL01MA-1,HO01IR-1	1,499,593	2212	1,404,559.00
	E1	EXISTING	ZATARY	500	250	TO UL01MA-1,HO01IR-1	0	500	317,550.00
	E1	EXISTING	ZATARY	500	250	TO UL01MA-1,HO01IR-1	0	500	317,550.00
	E1	EXISTING	ZATARY	380	265	TO UL01MA-1,HO01IR-1	0	440	279,444.00
TOTAL							**1,499,593**		**2,319,103.00**
WEST SYSTEM	W0	NEW	WADI AL ARAB PS0	675	127	TO PS1	466,463	395	251,070.00
	W0	NEW	WADI AL ARAB PS0	600	257	TO PS1	414,634	711	451,619.00
	W1	EXISTING	WADI AL ARAB PS1	576	235	TO PS2	0	560	340,837.00
	W1	EXISTING	WADI AL ARAB PS1	576	235	TO PS2	0	560	340,837.00
	W1	EXISTING -STAND BY	WADI AL ARAB PS1	576	235	TO PS2	0	-	-
	W1	EXISTING	WADI AL ARAB PS1	567	220	TO PS2	0	500	317,550.00
	W1	EXISTING	WADI AL ARAB PS1	567	220	TO PS2	0	500	317,550.00
	W1	EXISTING	WADI AL ARAB PS1	567	220	TO PS2	0	500	317,550.00
	W1	EXISTING -STAND BY	WADI AL ARAB PS1	567	220	TO PS2	0	-	-
	W2	EXISTING	WADI AL ARAB PS2	666	250	TO PS3	0	675	410,830.00
	W2	EXISTING -STAND BY	WADI AL ARAB PS2	666	250	TO PS3	0	-	-
	W2	EXISTING -STAND BY	WADI AL ARAB PS2	666	250	TO PS3	0	-	-
	W2	EXISTING	WADI AL ARAB PS2	567	216	TO PS3	0	500	304,319.00
	W2	EXISTING	WADI AL ARAB PS2	567	216	TO PS3	0	500	304,319.00
	W2	EXISTING	WADI AL ARAB PS2	567	216	TO PS3	0	500	304,319.00
	W2	EXISTING	WADI AL ARAB PS2	567	216	TO PS3	0	500	304,319.00
	W3	EXISTING -STAND BY	WADI AL ARAB PS3	666	250	TO WS01IR-1	0	-	-
	W3	EXISTING -STAND BY	WADI AL ARAB PS3	666	250	TO WS01IR-1	0	-	-
	W3	EXISTING -STAND BY	WADI AL ARAB PS3	666	250	TO WS01IR-1	0	-	-
	W3	EXISTING	WADI AL ARAB PS3	567	220	TO WS01IR-1	0	500	264,625.00
	W3	EXISTING	WADI AL ARAB PS3	567	220	TO WS01IR-1	0	500	264,625.00
	W3	EXISTING	WADI AL ARAB PS3	567	220	TO WS01IR-1	0	500	264,625.00
	W3	EXISTING -STAND BY	WADI AL ARAB PS3	567	76	TO WS01IR-1	0	-	-
	W4	EXISTING -STAND BY	ZUBDAT	300	190	TO HO01IR-1	0	-	-
	W4	EXISTING -STAND BY	ZUBDAT	500	200	TO HO01IR-1	0	-	-
	W4	EXISTING	ZUBDAT	500	200	TO HO01IR-1	0	400	201,115.00
TOTAL							**881,097**		**4,960,109.00**
WEHDEH	N0	NEW	NEW WEHDEH PS0	4110	239	TO PS1	2,840,244	4538	2,881,855.00
	N1	NEW	NEW WEHDEH PS1	4110	191	TO PS2	2,840,244	3619	2,298,406.00
	N2	NEW	NEW WEHDEH PS2	3292	194	TO WS01IR-1	2,274,959	2939	1,866,512.00
TOTAL							**7,955,447**		**7,046,773.00**
UPPER AQEB MAFRAQ	E2	NEW	NEW	485	154	TO MA02MA-1,MA03MA-1,MA05MA-1,MA06MA-1,MA07MA-1	335,163	345	219,305.00
	E14	NEW	SHAWAHED	72	139	TO UL22JE-1,UL23JE-1	41,463	37	23,499.00
	E13	EXISTING	ZNIYYA	80	220	TO MA05MA-1	0	90	57,159.00
	E13	EXISTING	ZNIYYA	100	204	TO MA06MA-1,MA07MA-1	0	90	57,159.00
TOTAL							**376,626**		**357,122.00**
SUMAYA KHALDIYEH	E1	NEW	ZATARY	33	192	TO ZS02MA-1	22,805	29	18,511.00
	E1	NEW	ZATARY	29	196	TO ZS07MA-1	20,041	26	16,663.00
	E3	NEW	KHALDIYEH	252	66	TO ZS06MA-1	174,146	77	48,667.00
	E9	NEW	KOUM AHMAR	89	55	TO ZS02MA-1	34,553	30	19,053.00
	E10	NEW	SUMAYA	2	149	TO ZS04MA-1	1,382	1	874.00
	E10	NEW	SUMAYA	316	97	TO ZS03MA-1	218,374	142	90,097.00
	E10	EXISTING	SUMAYA	100	100	TO ZS03MA-1,ZS01MA-1	-	55	34,931.00
	E11	NEW	SWAYLIMA	123	163	TO ZS05MA-1,ZS04MA-1	85,000	92	58,600.00
TOTAL							**556,301**		**287,396.00**

Table J-3 Estimated Cost of Pump Stations

Project	Pump Station ID	PUMP-STATUS	Pump Station Name	REQUIRED PUMP SET					
UM EL-LULU	E4	NEW	UM EL-LULU	48	90	TO UL02MA-1	33,171	20	12,617.00
	E4	NEW	UM EL-LULU	156	153	TO UL04MA-1,UL03MA-1	107,805	110	69,836.00
	E4	NEW	UM EL-LULU	168	244	TO UL07MA-1 ,UL08JE-1,UL09JE-1,UL10BO-1	116,098	189	120,086.00
	E4	EXISTING	UM EL-LULU	380	265	TO UL07MA-1 ,UL08JE-1,UL09JE-1,UL10BO-1	0	440	279,444.00
	E4	EXISTING -STAND BY	UM EL-LULU	300	250	TO UL07MA-1 ,UL08JE-1,UL09JE-1,UL10BO-1	0	-	-
	E12	NEW	RHAB WELL	27	126	UL06MA-1	18,659	16	9,988.00
TOTAL							**275,733**		**491,971.00**
HOFA	E5	NEW	HOFA	1326	264	TO HO08IR-1	916,341	1615	1,025,535.00
	E5	EXISTING -STAND BY	HOFA	380	265	TO HO08IR-1	0	-	-
	E5	EXISTING	HOFA	300	250	TO HO08IR-1	0	320	203,232.00
	E5	EXISTING	HOFA	200	250	TO HO08IR-1	0	225	142,898.00
	E5	NEW	HOFA	429	34	TO HO03BO-1	296,463	68	43,234.00
	E5	NEW	HOFA	87	89	TO HO05IR-1	60,122	36	22,667.00
	E6	NEW	SAMAD	791	189	TO HO24AJ-1	546,626	689	437,874.00
	E6	NEW	SAMAD	670	93	TO HO10IR-1	463,008	289	183,356.00
	E6	EXISTING -STAND BY	SAMAD	300	250	TO HO24AJ-1	0	-	-
	E6	EXISTING -STAND BY	SAMAD	200	250	TO HO24AJ-1	0	-	-
	E6	EXISTING	SAMAD	100	200	TO HO24AJ-1	0	115	73,037.00
	E6	EXISTING -STAND BY	SAMAD	150	250	TO HO24AJ-1	0	-	-
	E7	NEW	JUHFIYYA	29	236	TO HO06IR-1	20,041	32	20,030.00
	E7	EXISTING	JUHFIYYA	150	200	TO HO07IR-1,DS09AK-1	0	185	112,598.00
	E8	EXISTING	AIN AL TANOUR	160	225	TO HO14AJ-1,HO15AJ-1	0	160	76,212.00
	E8	EXISTING -STAND BY	AIN AL TANOUR	160	225	TO HO14AJ-1,HO15AJ-1	0	-	-
TOTAL							**2,302,601**		**2,340,673.00**
DEIR AS SINA	W3	NEW	WADI AL ARAB PS3	91	76	TO DS03IR-1	62,610	32	20,259.00
	W3	NEW	WADI AL ARAB PS3	588	17	TO DS05IR-1,DS01IR-1	406,341	46	29,001.00
	W3	NEW	WADI AL ARAB PS3	603	50	TO DS07AK-1,DS12AK-1	416,707	140	88,850.00
	W5	NEW	NEW	166	105	TO DS02IR-1	114,715	80	51,063.00
	W6	NEW	NEW	110	138	TO DS08AK-1	76,016	70	44,414.00
	W7	NEW	OYOON Al HAMAM	113	253	TO DS11AK-1	78,089	132	83,731.00
	W7	NEW	OYOON Al HAMAM	62	233	TO DS10AK-1	42,846	67	42,309.00
	W7	EXISTING	OYOON Al HAMAM	150	250	TO DS10AK-1	0	160	101,616.00
	W8	NEW	TUBNEH BOOSTER	62	242	TO DS10AK-1	42,846	69	43,953.00
	W9	NEW	NEW	413	183	TO DS13AK-1,DS14AK-1,DS15AK-1	285,407	348	221,052.00
	W10	NEW	OLD JUDYTA	22	275	TO HO13AK-1	15,203	28	17,714.00
	W10	NEW	OLD JUDYTA	140	286	TO DS16AJ-1,DS17AJ-1,DS18AJ-1	96,748	185	117,306.00
	W11	NEW	NEW	163	28	TO DS16AJ-1,DS17AJ-1,DS18AJ-1	112,642	21	13,367.00
	W12	EXISTING	ZUQAQ PS3	200	250	TO DS16AJ-1,DS17AJ-1,DS18AJ-1	0	230	139,987.00
	W12	EXISTING	ZUQAQ PS3	50	250	TO DS16AJ-1,DS17AJ-1,DS18AJ-1	0	75	47,633.00
	W12	EXISTING -STAND BY	ZUQAQ PS3	100	250	75	0	-	-
	W12	EXISTING -STAND BY	ZUQAQ PS3	150	250	TO DS16AJ-1,DS17AJ-1,DS18AJ-1	0	-	-
	W13	EXISTING	HALAWA-ZUQAQ PS3	80	230	TO ZUQAQ PS3	0	127	80,658.00
TOTAL							**1,750,170**		**1,142,913.00**
BANI KINANA RAMTHA	N2	NEW	NEW WEHDEH PS2	818	124	TO ZE10BK-1	565,285	469	297,887.00
	N3	NEW	AL MAHASI	79	75	TO KR07RA-1	54,593	27	17,304.00
TOTAL							**619,878**		**315,191.00**
GRAND TOTAL							**8,097,805**		**7,741,389.00**

Table J-4 Estimated Costs, Secondary Distribution Systems, from WLRP Report

PROJECT	WLRP Distribution System	WLRP Estimated Cost, $
Deir As Saneh	DS01IR-1	4,400,700
	DS02IR-1	1,349,975
	DS03IR-1	691,223
	DS04IR-1	1,144,833
	DS05AK-1	238,513
	DS06AK-1	823,349
	DS07AK-1	124,676
	DS08AK-1	1,856,313
	DS09AK-1	904,186
	DS10AK-1	471,901
	DS11AK-1	1,249,516
	DS12AK-1	694,811
	DS13AK-1	1,011,502
	ZE02	548,704
	ZE03	151,454
	ZE04	710,523
	ZE05	518,255
	ZE19	812,272
	ZE57	786,217
	ZE58	1,571,736
	ZE62	636,814
	ZE63	455,358
Deir As Saneh Total		**21,152,830**
Hofa	JE03JE-1	592,785
	JE04JE-1	220,091
	JE07JE-1	319,850
	ZE15	3,286,929
	ZE16	-
	ZE17	1,150,681
	ZE18	278,254
	ZE20	341,537
	ZE21	323,138
	ZE22	466,700
	ZE23	3,704,043
	ZE24	441,361
	ZE25	75,201
	ZE29	419,589
	ZE30	366,192
	ZE31	468,509
	ZE32	686,926
	ZE33	58,588
	ZE34	211,548
	ZE35	608,974
	ZE36	847,308
	ZE37	242,630
	ZE38	402,776
	ZE39	617,644
	ZE40	396,981
	ZE41	891,201
	ZE42	815,836
	ZE43	490,866
	ZE45	386,385
	ZE50	638,351
	ZE51	513,951
	ZE52	474,055

PROJECT	WLRP Distribution System	WLRP Estimated Cost, $
	ZE53	432,488
	ZE54	457,775
	ZE55	509,825
	ZE56	87,977
	ZE59	860,816
	ZE60	641,638
	ZE61	726,256
Hofa Total		**24,455,656**
Um El Lulu	JE01JE-1	811,958
	JE02JE-1	741,909
	JE05JE-1	665,196
	JE06JE-1	1,265,028
	JE09JE-1	2,387,705
	UL01MA-1	869,848
	UL02MA-1	475,691
	UL03MA-1	861,754
	UL04MA-1	-
	UL05MA-1	81,873
	UL06MA-1	256,832
	UL07MA-1	553,482
	UL08MA-1	869,975
	UL09MA-1	422,335
	UL10MA-1	1,161,176
	ZE26	1,212,681
	ZE27	734,979
	ZE28	196,569
	ZE44	100,215
	ZE46	1,105,983
	ZE47	511,332
	ZE48	907,918
	ZE49	831,874
Um El Lulu Total		**17,026,313**
Upper Aqeb Mafraq	UL12MA-1	284,040
	UL13MA-1	1,171,397
	UL14MA-1	1,025,934
	UL15MA-1	1,110,646
	ZA05MA-1	1,840,709
	ZA06MA-1	688,879
Upper Aqeb Mafraq Total		**6,121,605**
West System	ZE01	790,499
West System Total		**790,499**
Sumaya-Khaldiya	LM01	538,773
	ZA01MA-1	557,560
	ZA02MA-1	2,480,647
	ZA03MA-1	3,194,741
	ZA04MA-1	1,430,404
	ZA07MA-1	575,357
	ZA08MA-1	4,229,655
Sumaya-Khaldiya Total		**13,007,137**
Bani Kinana Ramtha	RA01	561,522
	RA02	6,819,558
	RA03	885,816
	RA04	1,585,318
	RA05	1,411,517
	RA06	999,225
	ZE06	2,350,065

PROJECT	WLRP Distribution System	WLRP Estimated Cost, $
	ZE07	845,802
	ZE08	664,315
	ZE09	2,091,748
	ZE10	4,260,819
	ZE11	135,580
	ZE12	820,719
	ZE13	1,868,347
	ZE14	401,724
Bani Kinana Ramtha Total		**25,702,073**
Grand Total		108,256,112

Appendix K
Development of 30 MCM from Wehdeh Dam and 4.4 MCM from King Abdullah Canal

K.1 Development of 30 MCM from Wehdeh Dam

Various alternatives have been considered for the abstraction of water from the upper Yarmouk. Currently under construction is a 110 MCM dam (a planned subsequent Stage 2 will bring the dam to 225 MCM) on the Yarmouk called the Wehdeh (Unity) Dam, scheduled for the reservoir to begin filling by the winter of 2005. Current plans include a discharge point downstream of the dam for channeling to irrigation as well as for a future proposed hydroelectric power station. Described herein is a preliminary plan for development of this source including a drinking water treatment plant and series of 3 pump stations to deliver the water to the Zubdat Reservoir in Irbid approximately 30 km to the south.

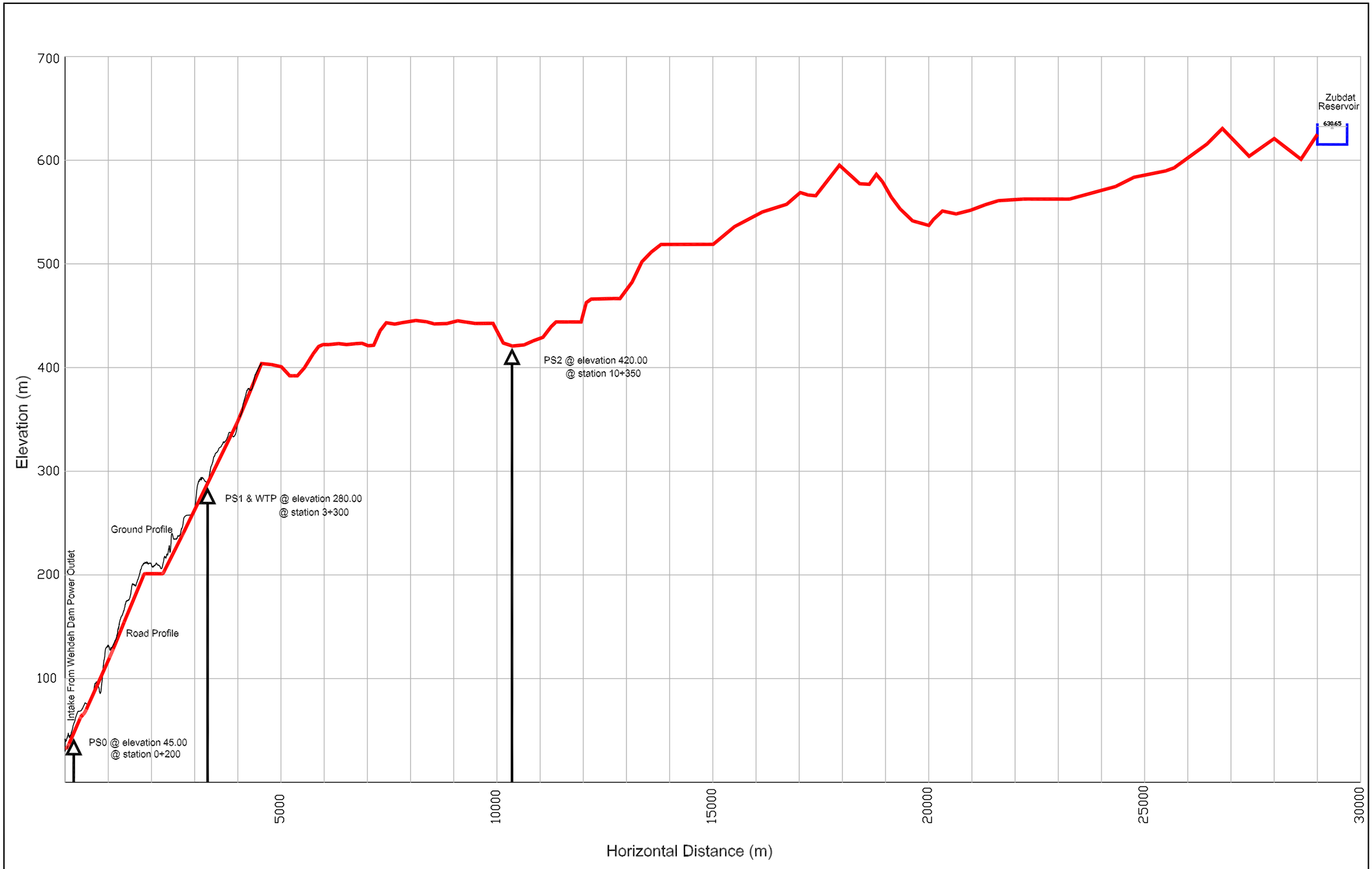
According to MWI and GOJ agreements, and based on the direction of the Jordan National Water Master Plan, the allocation from the Wehdeh Dam will be 30MCM annually, or an annual average of 3,425 m3/hr. Using a seasonal peak factor of 1.2, the design flow rate was determined to be 4,110m3/hr. Subsequent steps in the conceptual design are as follows:

Intake & PS0: Wehdeh Dam bid documents show a plan to discharge water via a conduit for irrigation and a future power station downstream of the dam at an elevation of 27 m. This site will also be leveled and graded for the future powerhouse location and appears appropriate as the site of the first pump station, called PS0. The elevation is dictated by the need for the pumps to be submerged when the reservoir is at its lowest (Elev. 50 m) and above the stated Wehdeh Dam PMF flood level (Elev. 36 m). PS0 is therefore set at Elev. 45 m. The pump station will be designed with variable speed pumps to adjust to variations in reservoir water level. The intake pipe will be connected to the existing (under construction) power conduit.

Pipeline: Due to land ownership and right of way constraints, there were not many options for the pipe routing other than along the dam site access roads and along the major road to Irbid. Using this routing as the basis, from the contour maps, a routing profile was drawn as shown in **Figure K-1**. Using typical design velocities and pipe loss factors, a pipe diameter of 1,100mm has been calculated.

PS1 and Water Treatment Plant: It appears most efficient to site both PS1 and the treatment facility at the same location. This allows backwash from the treatment facility to be discharged back to the Yarmouk River downstream of the dam. Preliminarily, the 2 pump stations PS1 and PS2 were determined to be located at an elevation such as to divide the total head from PS1 to Zubdat Reservoir into 2 equal parts. However, subsequent iterations that took into account pipe losses determined the most suitable location for PS1 and the WTP to be at Elev. 280 m. Based on the pipe routing map, this falls at station 3+100, and bordering the southwest edge of an existing quarry area, providing a large area suitable for locating the WTP and pump station. As detailed below, PS1 will be designed with a reservoir and constant speed pumps.

PS2: As described above, the locations of PS1 and PS2 were dictated by the need to match the two pump stations, i.e. allow them to have identical design criteria and be designed with the same pumps for efficiency in operations and maintenance. Based on calculations of the total head between PS1 and the Zubdat Reservoir, the elevation of PS2 was determined to be



NOT TO SCALE	THE HASHEMITE KINGDOM OF JORDAN MINISTRY OF WATER AND IRRIGATION WATER AUTHORITY		CDM CDM International Inc.	NORTHERN GOVERNORATES WATER TRANSMISSION SYSTEM FEASIBILITY STUDY WEHDEH–ZUBDAT TRANSMISSION SYSTEM PROFILE	PROJECT NO. 3029-42324 FIGURE NO. K–1

Elev. 461 m, which falls on a plateau at station 12+500. The pump station will be designed with a reservoir and constant speed pumps.

A schematic of the system is shown in **Figure K-2**.

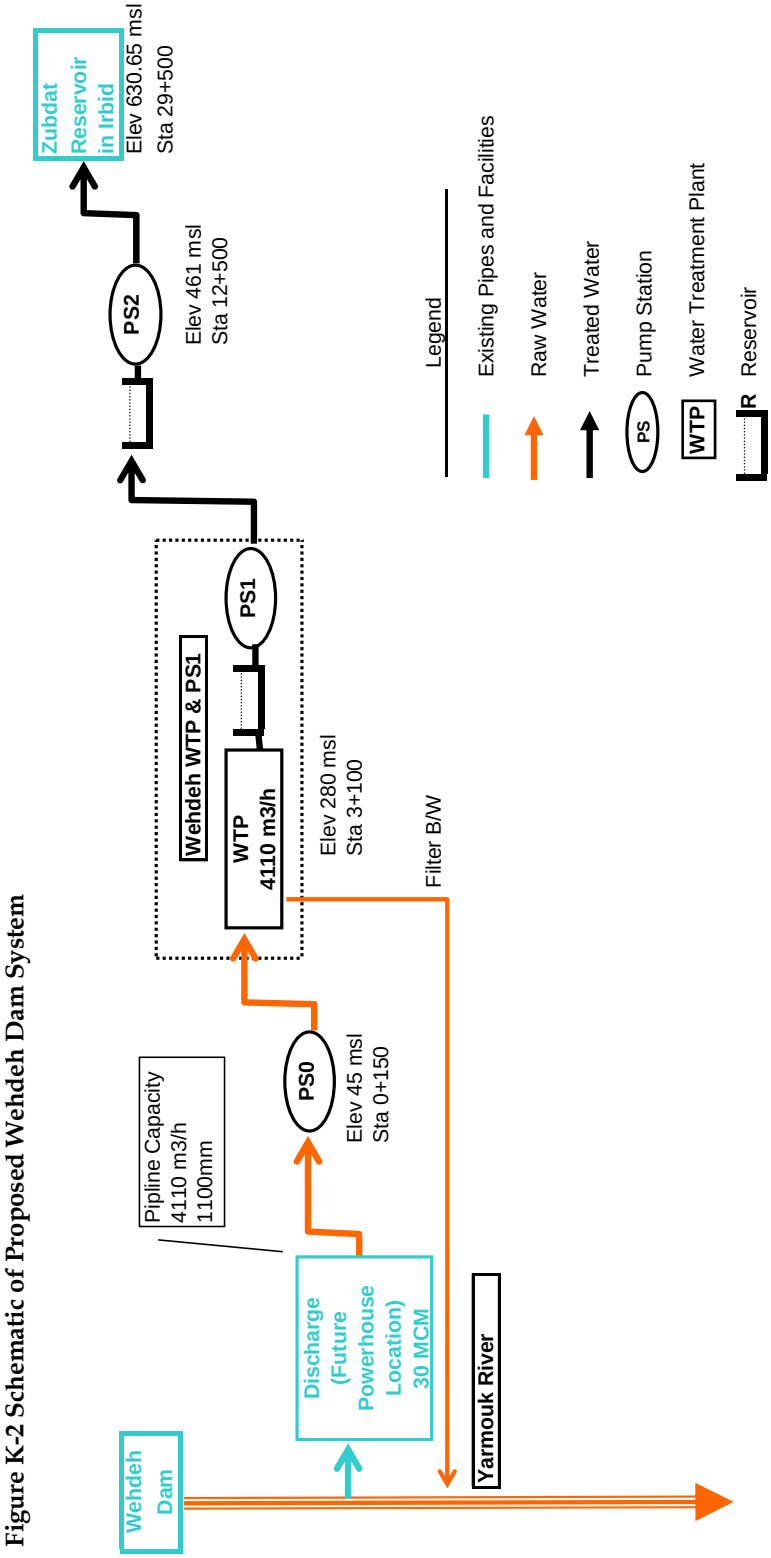


Figure K-2 Schematic of Proposed Wehdeh Dam System

K.2 Development of 500 m³/hour from King Abdullah Canal

Various alternatives have been considered for the development of 500m³/hour from the King Abdullah Canal (KAC). The thinking on development of this source is described here as incorporated in the proposed system . The existing Tabaqat Fahel (TF) and Wadi Al-Arab transmission system is shown in **Figure K-3**. As mentioned in Section 5.10 the water quality data available from WAJ indicate that the Tabaqat Fahel water meets the Jordanian water quality standards and does not need treatment other than disinfection. **Appendix D** presents the additional water quality data that was provided by WAJ Central lab and WAJ Irbid Lab. As shown in **Appendix D**, the newly-provided seven years of water quality data on Tabaqat Fahel wells confirms that the water meets the Jordanian Water Quality Standards.

However, after being mixed in the transmission pipeline with the water from the Manshyeh wells, the Tabaqat Fahel water becomes contaminated. Therefore currently, the mix of Tabaqat Fahel and Manshyeh water is treated at the Wadi Al-Arab WTP.

An important factor in modifying the use of the existing system is that a considerable amount of energy is currently wasted in the Tabaqat Fahel (TF) transmission at PS0 reservoir. The water from the TF wells is collected at a collection tank at an elevation of about –72 m, and then flows by gravity from the collection tank in a pipeline of 600 mm diameter for a distance of about 11 km, to the PS0 reservoir at an elevation of about –194 m. The PS0 pump station then pumps the water from its reservoir at Elevation –194 m to the inlet structure of Wadi Arab WTP at about Elevation 30 m. Only a small part of the available static head of 122 m between the TF wells and PS0 is needed to overcome the friction losses, since the full-pipe velocity is less than 1 m/s; the bulk of the available head is dissipated in open-channel gravity flow in the upstream end of the pipeline, or dissipated across a valve at the PS0 reservoir.

Figure K-4 shows a schematic of the proposed system for the new KAC WTP and a rearrangement of the piping that would utilize all the static head in the existing TF transmission. The proposed system includes disconnecting the Manshyeh wells from the TF transmission, and instead conveying the Manshyeh flow to the KAC in a new pipeline. This would keep the TF water uncontaminated, and thus it could be conveyed to the PS1 finished water reservoir, by-passing the Wadi Al-Arab WTP. As shown in **Figure K-4,** a new booster pump station would be added within the PS0 pump station, to utilize the available static head on the suction side that originates at the TF collection tank.

The KAC source will then be designed for 600 m3/h (instead of 500 m3/h) to make up the difference of diverting the Manshyeh raw water to the KAC. The treated water from the KAC WTP will be pumped to the PS0 reservoir, and the existing PS0 pumps will be used to pump the KAC treated water to the PS1 reservoir, by-passing the Wadi Al-Arab WTP. Both the TF boosted water and the KAC treated water would be carried in the existing pipeline between PS0 and PS1 (located near the Wadi Al-Arab water treatment plant).

The total flow pumped from PS0 to PS1 reservoir will range from 1150 to 1300 m3/h, which matches the design capacity of the existing transmission system.

Figure K-3 Tabaqet Fahel Existing & Wadi Arab Transmission System

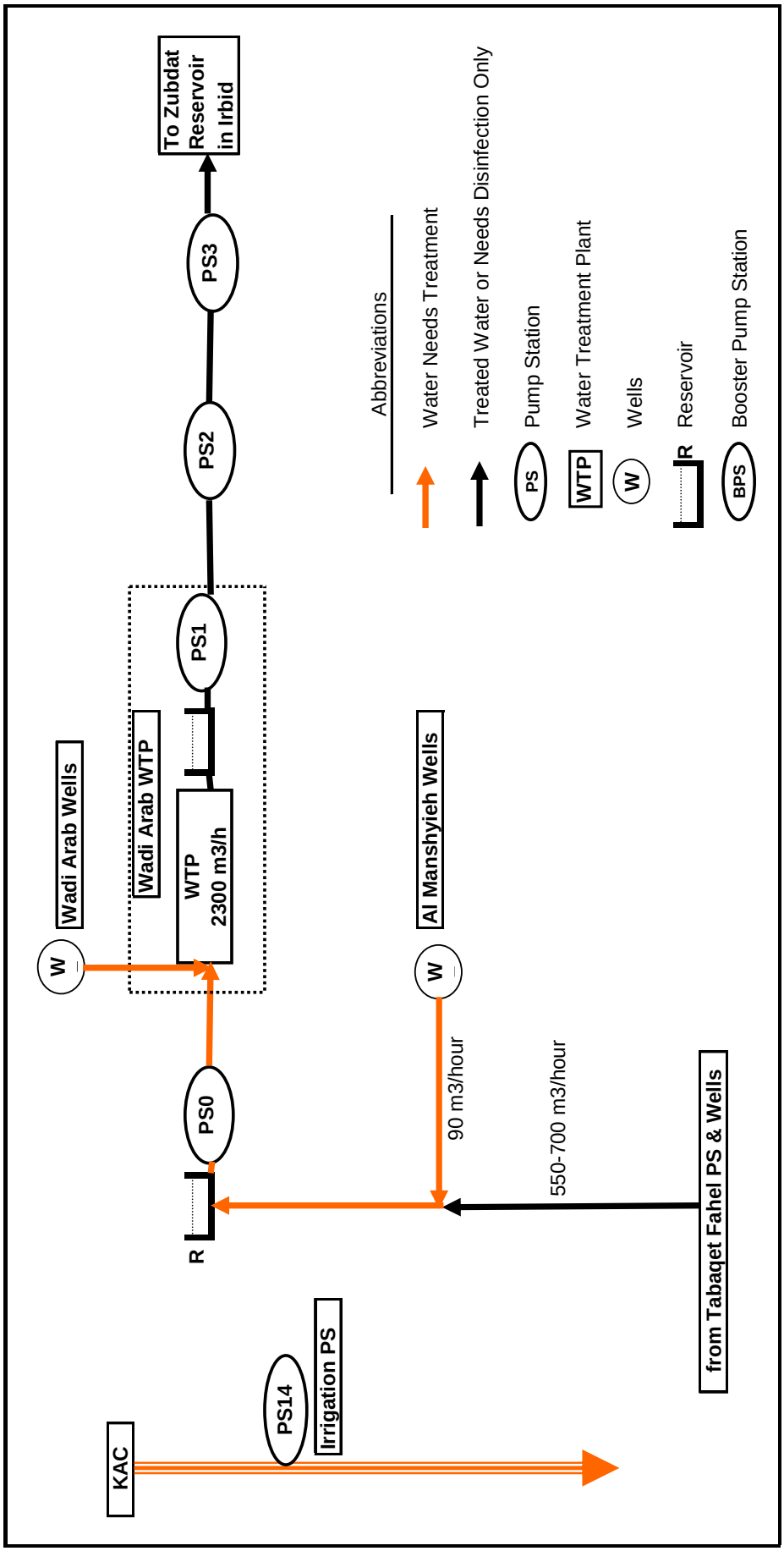
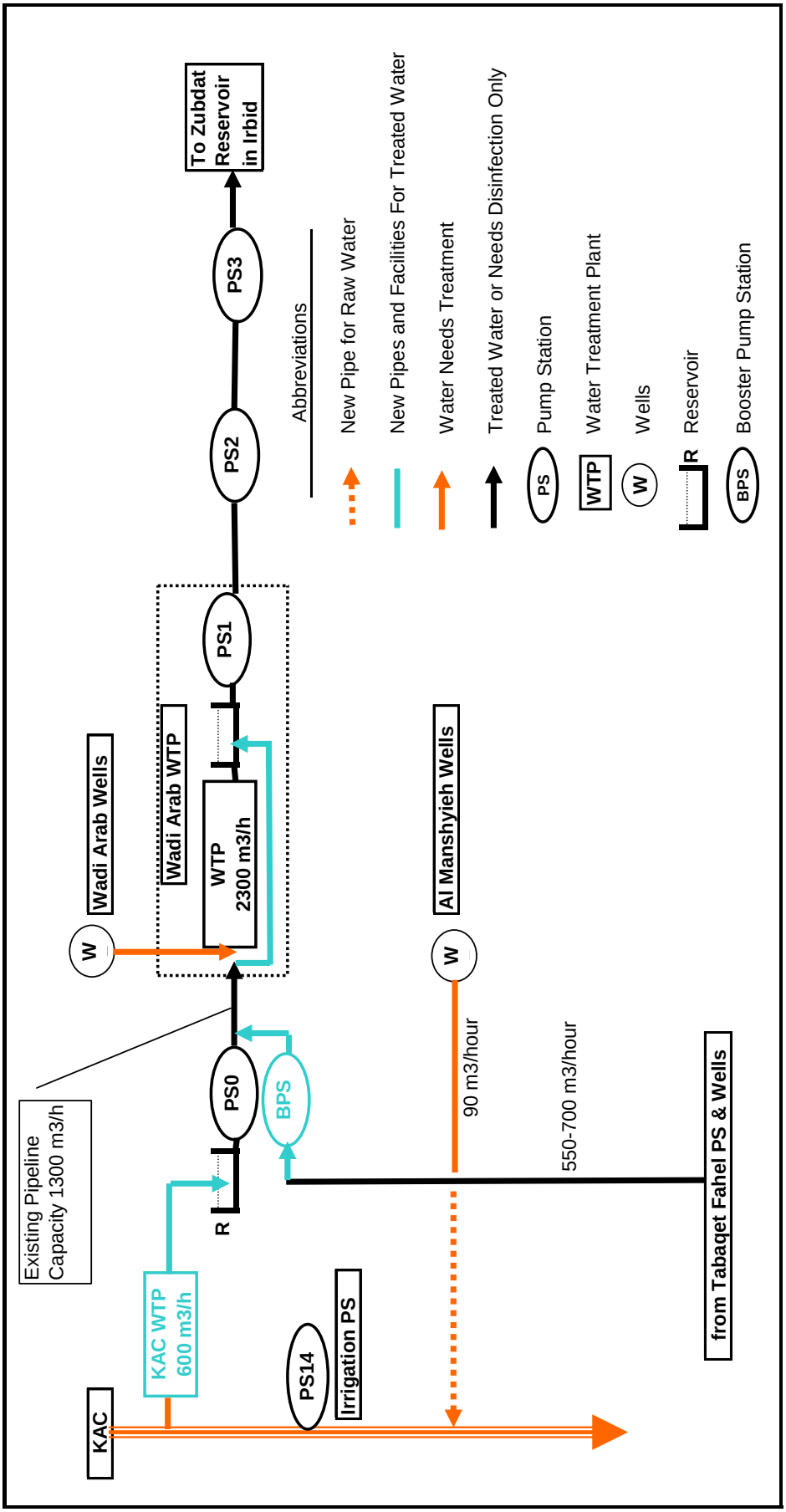


Figure K-4 Proposed KAC WTP in Tabaqet Fahel Existing & Wadi Arab Transmission System



Appendix L
Financial Analysis

L.1 Introduction

The financial analysis described herein is for the recommended Alternative 1 identified in Section 7, as refined to become the proposed or recommended system as described in Section 8. The costs considered in this financial analysis include the operation and maintenance costs for the existing system, plus the capital costs and O&M costs for the recommended system improvements. The proposed system is to be developed as ten projects phased over the years to 2018, as described in Section 8. The new facilities will be associated with the following systems: a) King Abdullah Canal Supply, b) Aqeb-Zatary Wells Supply, c) Al Wehdeh Dam Supply, d) Transmission and Distribution Subsystems, and e) Corridor Wells Supply. These are intended to serve the area supplied by the NGWA (Northern Governorate Water Authority) until the year 2030. The timing for these improvements and costs have been estimated from the phased project implementation schedule presented in Section 8.

NGWA is in effect only an operations and maintenance (O&M) entity responsible for the water and sewer systems in its service area, **and does not have purview over water tariffs and capital financing**. Currently, NGWA revenues are not enough to cover its operating costs and it is financially dependent on WAJ and Government of Jordan (GOJ). The NGWA revenues are returned to the GOJ, and therefore de-coupled from the annual subsidy transfer it receives from the Ministry of Finance. This transfer is based on NGWA's annual budget request. This financial dependency and the current bureaucracy mean that NGWA does not have control over tariffs nor discretionary control over revenue. Tariffs are set on a national basis. Pertinent to this financial analysis, this financial schism has precluded a realistic analysis of the effects on operating revenue of an increase in the water supply tariffs, and / or sewerage fees. Furthermore, there is another element of uncertainty, concerning the future administrative and financial structure of the organization. There are plans to optimize operations in the immediate years via an imminent German-funded management consultancy, but the terms, conditions and targets for such an effort have not yet been formalized.

L.2 Basis of Analysis

The financial analysis was prepared utilizing a Microsoft Excel ™ spreadsheet, which allows the user to make trial calculations and examine the effects of a wide range of variables. The spreadsheet will allow the NGWA, WAJ and/or other interested parties to test assumptions and generate various scenarios as future conditions become more certain. The financial conditions have been developed under the following broad categories:

- System Statistics – reflecting the fundamental data on the customer base, and the relevant volumes of water (produced, unaccounted-for, billed, and sold)
- Operations and Maintenance Costs – reflecting major O&M expenditures such as salaries and wages, electricity and administrative costs
- Capital Improvements Plan (CIP) – based on the proposed projects defined in

Section 8, including construction of new facilities, rehabilitation of existing facilities, and installation of a centralized monitoring and control system
- O&M Costs - associated with the projects forming the CIP
- Loans and Grants - for financing the capital costs of the CIP

The financial projections to year 2030 are based on "fixed" and "variable" assumptions of future conditions, of which the "fixed" forecasts (as developed earlier in the feasibility study or by others) include:

- Growth of the customer base - at the same rate as the population projection;
- Increasing volume of water available as CIP projects come online;
- Decrease in unaccounted for water (UFW) as forecast under the Water Loss Reduction Program (WLRP).

This left a number of "variables" for which assumptions were made and adjusted to create three financial scenarios:
- A base case, presented in **Table L-1**;
- A scenario incorporating improved O&M efficiency, presented in **Table L-2**; and,
- A scenario based on improved O&M efficiency as above, but also incorporating a best-case financing option, presented in **Table L-3**.

In the financial models for the period 2004-2030, the water production levels in the early years are less than the water demands of the users, but as the system capacity is improved and service extended in later years (after 2015), the demands and the production requirements will be equal although continuing to grow to 2030. Larger volumes of water will be "sold" or billed as a net result of the increased customer base, increases in per capita demands, improved capacity provided by the physical improvements and expansion of the system, and the reduction in unaccounted-for water. An additional 1%/yr increase in sales has been included starting from 2005 to reflect an across the board increase in national water tariffs. Since the tariffs are nationally set and de-coupled from operating revenue of local operating agencies such as NGWA, this was the only way to incorporate a variable to account for the need to charge a fair price for water.

For purposes of this analysis, the NGWA system statistics and annual costs and revenues are taken from the costs posted in the NGWA published year-end accounts for the years 2000, 2001 and 2002. For the year 2003 the numbers were taken from the un-audited draft year-end accounts and are therefore labeled as "Budget Actual" in the spreadsheet. It is important to recognize that the financial analysis utilizes the values for the 2003 year as a surrogate for the actual cost and revenues for service in that base year. The billing and collection figures for the years 2001, 2002, and 2003 were taken from the Water Authority of Jordan (WAJ) customer information section data base.

The System Statistics were projected as follows:

- Number of accounts were increased by the same ratio as the population projection used in the Feasibility Report. Intermediate-year values are by linear interpolation.
- Annual volume of exported water has been reduced gradually to 10,000,000 m^3 in 2007 and then stopped completely after that. No water will be needed in Amman from the NGWA system after then. The Corridor wells are not operated by NGWA, and hence their production is not considered as exported water.

- Volume of water imported into NGWA has been maintained at 2003 levels through 2030.
- Volume of water abstracted from NGWA Sources and the volume of water produced are considered synonymous and increase as expansion projects recommended in the feasibility study come on line.
- Volume of unaccounted-for water (UFW) in NGWA drops slowly based on the projections of the WLRP.
- Unaccounted-for water is assumed to be split 50/50 between physical and administrative losses.

In the financial modeling of capital improvements, the following assumptions have been made:

- WAJ and GOJ will be responsible for financing the physical facilities needed for the CIP.
- All GOJ funds used in financing of the facilities are considered as grants to NGWA, and will not have to be repaid by them. This recognizes that NGWA accounts will not be directly impacted by the financing; however the total surplus/deficit after financing the CIP was included to illustrate the point of view of WAJ.
- It was assumed that implementation of the CIP will follow the schedule presented Section 8 of this report. This led to the definition of the amounts of capital needed every year starting in 2005.
- Given the uncertainty in sources and structure of infrastructure funding, it was necessary to simplify the calculations of the debt burden. It was assumed that when borrowing, the Jordanian Ministry of Finance was going to borrow at the beginning of each year and make repayments once at the end of each year.
- Two types of loans were evaluated in financing the capital needs defined in the feasibility study:
    - In the Base Case and Efficient Operations Scenarios (**Tables L-1** and **L-2**): Borrowing of 100% of the needed capital cost using Commercial Loans with the following terms – 15 year repayment, with 2 year grace on Principal repayment, and 12 % per year simple interest on outstanding balance.
    - In the Best Case Scenario (**Table L-3**): Grant funding for 70% of the capital costs and borrowing of the remaining 30% using Soft Loans with the following terms – 30 year repayment, with 5 year grace on principal repayment, and 2 % per year simple interest on outstanding balance.
- Electricity prices paid by WAJ are subsidized at present, at 38 fils/kWh. There is a national trend to reduce such subsidies. It has been assumed that in 2009, an un-subsidized price estimated at 62 fils/kWh will be paid by WAJ and NGWA.

L.3 Base Case: Assumptions and Results

The Base Case presented in **Table L-1** assumes that NGWA's operations will continue at the current rates without significant improvements in efficiency. Inflation is not considered a factor as all the costs, including capital costs, are expressed in 2004 base costs. Any percentage changes in the projected numbers are considered "real" percentage increases or decreases in costs and revenues.

Annual O&M costs after the base year were projected as follows:

- Wage costs are increased by 5% per year through 2009 and then by 3% thereafter to 2030. This reflects the past increases during the period from 2000 to 2003.
- Electricity consumption efficiency for wells is assumed at 50% and for pumping stations it is assumed to be 60%. This results in a split in which 46% of the total power consumption occurs at wells, while the remaining 54% occurs at pump stations. No cost savings or improvements in efficiency have been assumed over the planning period to 2030.
- No write-off of arrears is taken into consideration, based on discussions with NGWA.
- Administrative costs are assumed to increase by 3% per year.

Annual revenues are projected as follows:

- Water sales are increased at the same rate as the increase in the customer base, with an additional percent increase based on the 1% increase attributed to "tariff increase" (Line 38).
- Sewerage revenue is allowed to increase at 5%.
- Revenue from tankers and Agriculture is considered to be included in the aggregate revenue increase in billing.
- Collection of billed revenue is assumed to increase to only 40% in 2009 based on the current low percentage collected of around 33%.
- 5% of prior years' arrears are assumed to be collected.
- Meter fees and non-operating revenues are projected to rise by 3% per year.
- Subsidy transfers from the MOF are assumed to be phased out after 2005 to give a realistic assessment of the Authority's actual revenue in a year.

Under this scenario, the gap between operation and maintenance costs and revenues, which is currently covered by a transfer from the Ministry of Finance, continues to grow year by year. The current transfer amounted to JD 4,304,861 in 2003. Without the subsidy transfer, the operating deficit starts at JD 11 million in 2005, and increases to JD 31 million by 2030. Clearly this is not a very healthy or sustainable financial picture, in which there is no surplus available for application towards capital financing.

When we add to the operating deficit the costs of borrowing and repayment of commercial loans, the picture becomes worse. The net deficit increases rapidly from JD 16 million in 2006 to JD 49 million in 2009, and reaches a peak of JD 62 million in 2015 before subsiding to JD 31 million in 2030.

Under the uniform nation-wide tariffs, NGWA receives about 0.30 JD/m^3 of metered water supply. This tariff is insufficient to pay the annual O&M cost. Assuming 100% revenue collection from the volume of water metered and billed, the results indicate an average unit price for O&M of about 0.55 JD/m^3, varying over the planning period within a relatively narrow range from 0.44 to 0.59 JD/m^3. Financing of capital projects at a 12% interest rate and 15-year repayment period would increase the total unit price of water to a peak of 1.05 JD/m^3 in 2016-2017, or about 3.5 times the current national water tariff.

L.4 Case of Efficient Operation and Commercial Financing

Possible efficiency improvements are incorporated into the financial analysis for the water supply system by basing portions of the analyses on factors which either decrease operating

costs or increase revenues. The types of savings considered include: direct savings in operating costs due to increased efficiency in operations; increased collection of water supply and sewerage billings; and reduction of unaccounted-for or non-revenue water supply. (In utility terms, unaccounted for water is the difference in the volume of water produced and the volume of water billed. Thus unaccounted for water is comprised of system leakage and other losses, under-registration of customer meters, metering losses from tampering or illegal connections, free water supplied to institutions or government entities -- such as schools, hospitals, mosques, or military facilities -- or water used for general municipal purposes.)

The System Statistics in this improved system are the same as the base Scenario in **Table L-1**. We have forecast the improvements by setting targets, for reduction in unaccounted-for water, for overall cost reduction, and for increases in collection of arrears. **Tables L-2 and L-3** incorporate the results if efficiency improvements are achieved. In both tables the operation is the same; the only difference is in the method of financing the capital costs, as described subsequently.

The Annual Operation and Maintenance costs have been modified as follows:

- The O&M efficiency improvements are reflected as an overall percentage reduction in the O&M costs. The analysis assumes that two successive programs will be launched to achieve that. The first, between the years 2005 and 2008, is targeted to reduce the costs by 4% in the first year, then by 5% for each of the following two years and peaks at a reduction of 6% in 2008. After one year of assessment, a second efficiency program will be launched, and aimed to reduce the costs by 4% in 2010, 6% in 2011, 8% in 2012, and 10% in 2013.
- Collection of arrears in water billings will be expected to increase to 85% by 2009 based on the aggressive targets of the imminent NGWA Management Consultancy. It will then hold at 85% for the duration of the analysis to 2030.
- This increase in revenue can be balanced by allowing NGWA to write-off 10% of the arrears per year, which is an added cost, but is prudent financial practice. This would require some changes in legislation or in the NGWA charter as a government owned entity. If this proves unwieldy, then the savings in costs and increased revenue would be the much higher.

As shown in **Table L-2**, the deficit in operations (revenue minus O&M cost) of JD 11 million in 2005 would decline slowly after 2012, to JD 6.5 million in 2030. Commercial financing of capital projects would drive the total deficit to a peak of JD 44 million in 2015. The unit price of O&M would decline to less than 0.45 JD/m^3 after 2011, and the total unit price including commercial financing would reach a maximum of 0.89 JD/m^3 in the years 2015-2017.

L.5 Case of Efficient Operation and Financing by Grants and Soft Loans

The scenario shown in **Table L-3** assumes that grants are used to finance 70% of the capital costs, while 30% of these costs are borrowed as soft loans at concessionary terms. As a result, the maximum total deficit would be substantially reduced, from the JD 46 million in 2015 shown in **Table L-2**, to a maximum deficit of JD 16 million in 2009 as shown in **Table L-3**. The unit price of water billed would also be substantially reduced, to less than 0.49 JD/m^3 in 2006-30, which is only about 1.6 times the existing average tariff on water to NGWA customers.

Table L-1 BASE OPERATIONS, COMMERCIAL FINANCING OF CAPITAL PROJECTS

			Historical Data	Historical Data	Audited Accounts	Budget Actual	Projections For Fiscal Year Shown																									
		UNITS	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
	SYSTEM STATISTICS																															
1	Number of Customers Listed by NGWA	No	na	na	177,085	185,591	189,934	194,378	198,927	203,184	207,532	211,973	216,509	220,493	224,550	228,682	232,890	237,175	240,732	244,343	248,009	251,729	255,505	258,545	261,622	264,735	267,885	271,073	273,540	276,029	278,541	281,076	283,634
2	Growth Rate per Table 4-2					2.34%	2.34%	2.34%	2.34%	2.14%	2.14%	2.14%	2.14%	1.84%	1.84%	1.84%	1.84%	1.84%	1.50%	1.50%	1.50%	1.50%	1.50%	1.19%	1.19%	1.19%	1.19%	1.19%	0.91%	0.91%	0.91%	0.91%	0.91%
3	No. of Customers w/Meters Listed by NGWA	No	na	na	177,085	177,085	184,366	191,646	198,927	203,184	207,532	211,973	216,509	220,493	224,550	228,682	232,890	237,175	240,732	244,343	248,009	251,729	255,505	258,545	261,622	264,735	267,885	271,073	273,540	276,029	278,541	281,076	283,634
4	Volume of Exported to other Governorates	m3	16,046,749	14,639,687	12,354,806	11,373,420	10,915,614	10,610,409	10,406,939	10,000,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Volume Imported from other Governorates	m3	619,400	517,580	413,869	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454
6	Volume Available for NGWA Customers	m3	na	56,802,165	55,839,707	56,180,257	56,638,064	56,943,268	63,600,000	75,300,000	75,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	115,300,000	115,300,000	115,300,000	115,300,000	115,300,000	115,300,000	115,300,000	120,300,000	120,300,000	120,300,000	122,300,000	124,300,000	124,300,000
7	Volume Produced from NGWA sources	m3	na	70,924,272	67,780,645	67,144,224	67,144,224	67,144,224	73,597,486	84,890,546	74,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	114,890,546	114,890,546	114,890,546	114,890,546	114,890,546	114,890,546	114,890,546	119,890,546	119,890,546	119,890,546	121,890,546	123,890,546	123,890,546	123,890,546
8	Volume Sold to NGWA Customers (WAJ)	m3	na	27,322,362	27,766,131	28,864,126	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
9	Volume Billed to Accounts (CDM Est.)	m3	25,381,206	27,041,682	27,800,000	28,792,382	30,896,064	32,002,117	38,287,200	48,342,600	51,354,600	76,026,600	80,238,600	80,491,320	80,744,040	80,996,760	81,249,480	81,502,200	81,502,200	81,502,200	89,242,200	89,242,200	89,242,200	89,841,760	90,441,320	91,040,880	95,614,440	96,240,000	96,240,000	97,840,000	99,440,000	99,440,000	99,440,000
10	% of Accounted for Water in NGWA system	%		47.6%	49.8%	51.3%	54.6%	56.2%	60.2%	64.2%	68.2%	72.2%	76.2%	76.4%	76.7%	76.9%	77.2%	77.4%	77.4%	77.4%	77.4%	77.4%	77.4%	77.9%	78.4%	79.0%	79.5%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
11	Volume of Unnacounted For Water	m3	na	29,479,803	28,073,576	27,316,131	25,742,000	24,941,152	25,312,800	26,957,400	23,945,400	29,273,400	25,061,400	24,808,680	24,555,960	24,303,240	24,050,520	23,797,800	23,797,800	23,797,800	26,057,800	26,057,800	26,057,800	25,458,240	24,858,680	24,259,120	24,685,560	24,060,000	24,060,000	24,460,000	24,860,000	24,860,000	24,860,000
12	% Unnacounted due to "Physical Losses"	%			25.2%	24.4%	22.7%	21.9%	19.9%	17.9%	15.9%	13.9%	11.9%	11.8%	11.7%	11.5%	11.4%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.0%	10.8%	10.5%	10.3%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
13	% Unnacounted due to " Administrative Losses"	%			25.1%	24.4%	22.7%	21.9%	19.9%	17.9%	15.9%	13.9%	11.9%	11.8%	11.7%	11.5%	11.4%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.0%	10.8%	10.5%	10.3%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
	SYSTEM-WIDE ANNUAL O&M COST																															
14	Salaries & Wages	JD	4,902,086	4,965,255	4,760,475	5,178,076	5,436,980	5,708,829	5,994,270	6,293,984	6,608,683	6,939,117	7,147,291	7,361,709	7,582,561	7,810,037	8,044,339	8,285,669	8,534,239	8,790,266	9,053,974	9,325,593	9,605,361	9,893,522	10,190,327	10,496,037	10,810,918	11,135,246	11,469,303	11,813,382	12,167,784	12,532,817	12,908,802
15	O&M Expenses, Excluding Electricity	JD	2,044,772	2,127,551	2,396,189	2,603,829	2,603,829	2,603,829	2,854,084	3,292,025	2,904,229	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,455,414	4,455,414	4,455,414	4,455,414	4,455,414	4,455,414	4,649,313	4,649,313	4,649,313	4,726,872	4,804,431	4,804,431	4,804,431
16	Electricity Cost @ 38 fils/kwh; 62 fils in 2009	JD	7,110,987	7,036,271	7,513,543	7,990,208	7,990,208	7,990,208	8,758,151	10,102,032	10,102,032	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	22,307,033	22,307,033	22,307,033	22,307,033	22,307,033	22,307,033	23,277,828	23,277,828	23,277,828	23,666,146	24,054,464	24,054,464	24,054,464
17	Electricity Cost for Wells, 46% of total					3,676,635	3,676,635	3,676,635	4,028,749	4,646,935	4,646,935	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	10,261,235	10,261,235	10,261,235	10,261,235	10,261,235	10,261,235	10,707,801	10,707,801	10,707,801	10,886,427	11,065,054	11,065,054	11,065,054
18	Electricity Cost for Pump Stations, 54% of total					4,313,573	4,313,573	4,313,573	4,729,401	5,455,097	5,455,097	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	12,045,798	12,045,798	12,045,798	12,045,798	12,045,798	12,045,798	12,570,027	12,570,027	12,570,027	12,779,719	12,989,411	12,989,411	12,989,411
19	Administrative Expenses (3% increase)	JD	189,204	217,265	285,284	266,703	274,704	282,945	291,434	300,177	309,182	318,457	328,011	337,851	347,987	358,427	369,179	380,255	391,662	403,412	415,515	427,980	440,819	454,044	467,665	481,695	496,146	511,031	526,361	542,152	558,417	575,169	592,424
20	Purchase of Imported Water	JD	169,359	319,915	40,026	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599
21	Cost Savings, % of Previous Year	%			0.0%	0.0%	0.0%																										
22	Wages, Materials etc. with Savings	JD	14,247,049	14,346,342	14,955,491	16,078,415	16,345,320	16,625,410	17,937,538	20,027,817	19,963,725	31,730,235	31,947,962	32,172,221	32,403,208	32,641,124	32,886,178	33,138,584	33,398,561	33,666,338	36,271,535	36,555,620	36,848,227	37,149,612	37,460,039	37,779,779	39,273,804	39,613,016	39,962,404	40,788,152	41,624,695	42,006,481	42,399,721
23	Taxes	JD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	Write-off of Accumulated Arrears	JD					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	Total Annual O&M Cost (incl. Savings)	JD	14,247,049	14,346,342	14,955,491	16,078,415	16,345,320	16,625,410	17,937,538	20,027,817	19,963,725	31,730,235	31,947,962	32,172,221	32,403,208	32,641,124	32,886,178	33,138,584	33,398,561	33,666,338	36,271,535	36,555,620	36,848,227	37,149,612	37,460,039	37,779,779	39,273,804	39,613,016	39,962,404	40,788,152	41,624,695	42,006,481	42,399,721
	NGWA REVENUES																															
26	Water sales to customers inlc tarriff increase	JD	6,593,531	6,849,145	6,504,413	7,767,600	7,949,362	8,216,731	8,493,092	8,761,593	9,038,582	9,324,328	9,619,107	9,894,059	10,176,871	10,467,767	10,766,977	11,074,741	11,353,271	11,638,805	11,931,521	12,231,599	12,539,224	12,815,325	13,097,505	13,385,899	13,680,644	13,981,878	14,250,204	14,523,680	14,802,403	15,086,476	15,376,001
27	Sewerage and drainage fees (5%/yr)	JD	662,178	826,172	861,774	957,785	1,005,674	1,055,958	1,108,756	1,164,194	1,222,403	1,283,524	1,347,700	1,415,085	1,485,839	1,560,131	1,638,137	1,720,044	1,806,046	1,896,349	1,991,166	2,090,725	2,195,261	2,305,024	2,420,275	2,541,289	2,668,353	2,801,771	2,941,859	3,088,952	3,243,400	3,405,570	3,575,848
28	Water Sales by Tankers	JD	103,549	128,828	151,427	273,588																											
29	Revenue from Exported Water	JD	1,454,332	1,609,777	1,358,532	1,250,619	1,200,279	1,166,718	1,144,345	1,099,598	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	Revenue from Water Sales to Agriculture	JD	15,348	13,602	13,428	10,606																											
31	Total Billing to Customers	JD	8,828,938	9,427,524	8,889,574	10,260,198	10,155,315	10,439,407	10,746,193	11,025,384	10,260,985	10,607,851	10,966,807	11,309,144	11,662,710	12,027,898	12,405,115	12,794,785	13,159,317	13,535,154	13,922,687	14,322,324	14,734,484	15,120,349	15,517,780	15,927,188	16,348,997	16,783,649	17,192,063	17,612,632	18,045,803	18,492,046	18,951,849
32	Collections, % of Total Billing	%	23.2%	31.1%	33.2%	33.2%	33.0%	35.0%	36.0%	37.0%	39.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
33	Total Collections for Water	JD	2,049,962	2,931,064	2,955,082	3,410,706	3,351,254	3,653,792	3,868,629	4,079,392	4,001,784	4,243,140	4,386,723	4,523,658	4,665,084	4,811,159	4,962,046	5,117,914	5,263,727	5,414,062	5,569,075	5,728,929	5,893,794	6,048,139	6,207,112	6,370,875	6,539,599	6,713,459	6,876,825	7,045,053	7,218,321	7,396,819	7,580,740
34	Current-Year Arrears	JD	6,778,976	6,496,460	5,934,492	6,849,492	6,804,061	6,785,615	6,877,564	6,945,992	6,259,201	6,364,711	6,580,084	6,785,486	6,997,626	7,216,739	7,443,069	7,676,871	7,895,590	8,121,092	8,353,612	8,593,394	8,840,691	9,072,209	9,310,668	9,556,313	9,809,398	10,070,189	10,315,238	10,567,579	10,827,482	11,095,228	11,371,110
35	Revenue from Prior Years Arrears	JD					342,475	340,203	339,281	343,878	347,300	312,960	318,236	329,004	339,274	349,881	360,837	372,153	383,844	394,780	406,055	417,681	429,670	442,035	453,610	465,533	477,816	490,470	503,509	515,762	528,379	541,374	554,761
36	Subscribers' meter fees (3%)	JD	178,730	189,092	195,081	199,369	205,350	211,511	217,856	224,392	231,123	238,057	245,199	252,555	260,131	267,935	275,973	284,253	292,780	301,564	310,610	319,929	329,527	339,412	349,595	360,083	370,885	382,012	393,472	405,276	417,434	429,957	442,856
37	Non-Operating Revenues (3%)	JD	837,901	1,311,685	1,275,716	1,313,987	1,353,407	1,394,009	1,435,830	1,478,904	1,523,272	1,568,970	1,616,039	1,664,520	1,714,456	1,765,889	1,818,866	1,873,432	1,929,635	1,987,524	2,047,150	2,108,564	2,171,821	2,236,976	2,304,085	2,373,208	2,444,404	2,517,736	2,593,268	2,671,066	2,751,198	2,833,734	2,918,746
38	Tariff Increases In Year	%						1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
39	Total Annual Revenue		3,066,593	4,431,841	4,425,879	4,924,063	5,252,486	5,599,515	5,861,596	6,126,566	6,103,479	6,363,127	6,566,196	6,769,737	6,978,945	7,194,865	7,417,722	7,647,752	7,869,985	8,097,929	8,332,890	8,575,103	8,824,811	9,066,562	9,314,402	9,569,699	9,832,703	10,103,677	10,367,075	10,637,157	10,915,333	11,201,884	11,497,103
40	Subsidy Transfer from MOF	JD	4,401,480	3,418,041	4,595,120	4,304,861	4,631,248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	Revenues from Private Contributions	JD				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	Total Actual Authority Revenue	JD	10,534,665	12,281,723	13,446,878	14,152,986	9,883,734	5,599,515	5,861,596	6,126,566	6,103,479	6,363,127	6,566,196	6,769,737	6,978,945	7,194,865	7,417,722	7,647,752	7,869,985	8,097,929	8,332,890	8,575,103	8,824,811	9,066,562	9,314,402	9,569,699	9,832,703	10,103,677	10,367,075	10,637,157	10,915,333	11,201,884	11,497,103
43	OPERATING SURPLUS, Rev. less O&M	JD	-3,712,384	-2,064,619	-1,508,613	-1,925,429	-6,461,586	-11,025,895	-12,075,942	-13,901,250	-13,860,246	-25,367,107	-25,381,766	-25,402,484	-25,424,262	-25,446,259	-25,468,456	-25,490,832	-25,528,576	-25,568,410	-27,938,645	-27,980,517	-28,023,416	-28,083,050	-28,145,637	-28,210,080	-29,441,101	-29,509,339	-29,595,330	-30,150,995	-30,709,362	-30,804,597	-30,902,617
44	SURPLUS AVAIL FOR SELF FINANCE	JD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	COSTS OF CAPITAL PROJECTS, from feasibility study																															
45	King Abdullah Canal Supply	JD						2,340,426	6,618,793	0	0	0	0	0	0	0	0	0	0	0	0											
46	Aqeb-Zatary Wells Supply	JD						0	12,765,957	7,030,492	0	0	0	0	0	0	0	0	0	0	0											
47	Al Wehdeh Dam Supply	JD						0	2,624,113	6,028,369	23,404,255	3,635,942	0	0	0	0	0	0	0	0	0											
48	Trans/Dist. Subsystems	JD						0	11,514,518	23,029,036	23,029,036	23,029,036	14,634,428	14,634,428	14,634,428	15,528,162	15,528,162	15,528,162	0	0	0											
49	Corridor Wells Supply	JD						0	0	0	0	0	0	0	0	0	0	0	0	4,184,397	620,715											
50	Total	JD						2,340,426	33,523,382	36,087,897	46,433,291	26,664,978	14,634,428	14,634,428	14,634,428	15,528,162	15,528,162	15,528,162	0	4,184,397	620,715	0	0	0	0	0	0	0	0	0	0	0	0
	O&M COSTS FOR CAPITAL PROJECTS																															
51	King Abdullah Canal Supply	JD						0	0	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820
52	Al Wehdeh Dam Supply	JD						0	0	0	0	2,775,385	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770
53	Pump Stations	JD						0	0	758,953	1,698,498	3,945,593	5,119,953	5,866,364	6,612,774	7,359,185	8,151,179	8,943,173	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167
54	Total	JD	0	0	0	0	0	0	0	1,482,773	2,422,318	7,444,799	11,394,544	12,140,954	12,887,365	13,633,775	14,425,769	15,217,764	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758
55	TOTAL SURPLUS, Op. Surplus less Project Costs	JD	-3,712,384	-2,064,619	-1,508,613	-1,925,429	-6,461,586	-13,366,320	-45,599,324	-51,471,921	-62,715,856	-59,476,884	-51,410,738	-52,177,866	-52,946,055	-54,608,197	-55,422,388	-56,236,758	-41,538,334	-45,762,565	-44,569,118	-43,990,275	-44,033,174	-44,092,808	-44,155,395	-44,219,838	-45,450,859	-45,519,097	-45,605,088	-46,160,753	-46,719,120	-46,814,355	-46,912,375
	Unit O&M Cost = (Current+New O&M Costs)/Volume Billed	JD/m3	0.56	0.53	0.54	0.56	0.53	0.52	0.47	0.44	0.44	0.52	0.54	0.55	0.56	0.57	0.58	0.59	0.61	0.61	0.59	0.59	0.59	0.59	0.59	0.59	0.58	0.58	0.58	0.58	0.58	0.58	0.59
	Total Unit Cost = (O&M+Cap Financing Cost)/Volume Billed	JD/m3	0.56	0.53	0.54	0.56	0.53	0.53	0.59	0.64	0.78	0.83	0.89	0.93	0.96	0.99	1.02	1.04	1.05	1.05	0.96	0.95	0.92	0.87	0.81	0.75	0.69	0.67	0.66	0.64	0.62	0.60	0.59
	ASSUMED FINANCING OF CAPITAL COSTS		FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
56	AMOUNT BORROWED*	US$1000						3,500	50,000	55,000	65,000	42,000	20,000	20,000	20,000	24,000	24,000	24,000															
57	Principal Amount Owed at beginning of Year	US $					0	3,500,000	53,500,000	108,500,000	173,230,769	211,115,385	222,769,231	229,423,077	232,846,154	238,730,769	243,076,923	245,884,615	222,846,154	203,961,538	179,730,769	153,000,000	125,807,692	98,692,308	75,423,077	56,384,615	42,346,154	31,538,462	22,269,231	14,538,462	8,346,154	4,000,000	1,500,000
58	Yearly Interest payment at 12% per year	JD					0	294,000	4,494,000	9,114,000	14,551,385	17,733,692	18,712,615	19,271,538	19,559,077	20,053,385	20,418,462	20,654,308	18,719,077	17,132,769	15,097,385	12,852,000	10,567,846	8,290,154	6,335,538	4,736,308	3,557,077	2,649,231	1,870,615	1,221,231	701,077	336,000	126,000
59	Yearly Principal payment	JD					0	0	0	188,462	2,880,769	5,842,308	9,342,308	11,603,846	12,680,769	13,757,692	14,834,615	16,126,923	17,419,231	18,711,538	18,711,538	19,034,615	18,980,769	16,288,462	13,326,923	9,826,923	7,565,385	6,488,462	5,411,538	4,334,615	3,042,308	1,750,000	457,692
60	Total Payment on Principal & Interest	JD					0	294,000	4,494,000	9,302,462	17,432,154	23,576,000	28,054,923	30,875,385	32,239,846	33,811,077	35,253,077	36,781,231	36,138,308	35,844,308	33,808,923	31,886,615	29,548,615	24,578,615	19,662,462	14,563,231	11,122,462	9,137,692	7,282,154	5,555,846	3,743,385	2,086,000	583,692
61	TOTAL SURPLUS, after Capital Finance	JD					-6,461,586	-11,319,895	-16,569,942	-23,203,712	-31,292,400	-48,943,107	-53,436,689	-56,277,869	-57,664,109	-59,257,336	-60,721,533	-62,272,062	-61,666,884	-61,412,717	-61,747,568	-59,867,132	-57,572,031	-52,661,666	-47,808,098	-42,773,311	-40,563,563	-38,647,032	-36,877,484	-35,706,841	-34,452,747	-32,890,597	-31,486,310

*Assume new borrowings at commercial terms - 2-yr grace on Principal, 15-yr Repayment, 12% interes

Table L-2 EFFICIENT OPERATIONS, COMMERCIAL FINANCING OF CAPITAL PROJECTS

			Historical Data	Historical Data	Audited Accounts	Budget Actual	Projections For Fiscal Year Shown																										
		UNITS	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
	SYSTEM STATISTICS																																
1	Number of Customers Listed by NGWA	No	na	na	177,085	185,591	189,934	194,378	198,927	203,184	207,532	211,973	216,509	220,493	224,550	228,682	232,890	237,175	240,732	244,343	248,009	251,729	255,505	258,545	261,622	264,735	267,885	271,073	273,540	276,029	278,541	281,076	283,634
2	Growth Rate per Table 4-2					2.34%	2.34%	2.34%	2.34%	2.14%	2.14%	2.14%	2.14%	1.84%	1.84%	1.84%	1.84%	1.84%	1.50%	1.50%	1.50%	1.50%	1.50%	1.19%	1.19%	1.19%	1.19%	1.19%	0.91%	0.91%	0.91%	0.91%	0.91%
3	No. of Customers w/Meters Listed by NGWA	No	na	na	177,085	177,085	184,366	191,646	198,927	203,184	207,532	211,973	216,509	220,493	224,550	228,682	232,890	237,175	240,732	244,343	248,009	251,729	255,505	258,545	261,622	264,735	267,885	271,073	273,540	276,029	278,541	281,076	283,634
4	Volume of Exported to other Governorates	m3	16,046,749	14,639,687	12,354,806	11,373,420	10,915,614	10,610,409	10,406,939	10,000,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Volume Imported from other Governorates	m3	619,400	517,580	413,869	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454
6	Volume Available for NGWA Customers	m3	na	56,802,165	55,839,707	56,180,257	56,638,064	56,943,268	63,600,000	75,300,000	75,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	115,300,000	115,300,000	115,300,000	115,300,000	115,300,000	115,300,000	115,300,000	120,300,000	120,300,000	120,300,000	122,300,000	124,300,000	124,300,000
7	Volume Produced from NGWA sources	m3	na	70,924,272	67,780,645	67,144,224	67,144,224	67,144,224	73,597,486	84,890,546	74,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	114,890,546	114,890,546	114,890,546	114,890,546	114,890,546	114,890,546	114,890,546	119,890,546	119,890,546	119,890,546	121,890,546	123,890,546	123,890,546	123,890,546
8	Volume Sold to NGWA Customers (WAJ)	m3	na	27,322,362	27,766,131	28,864,126	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
9	Volume Billed to Accounts (CDM Est.)	m3	25,381,206	27,041,682	27,800,000	28,792,382	30,896,064	32,002,117	38,287,200	48,342,600	51,354,600	76,026,600	80,238,600	80,491,320	80,744,040	80,996,760	81,249,480	81,502,200	81,502,200	81,502,200	89,242,200	89,242,200	89,242,200	89,841,760	90,441,320	91,040,880	95,614,440	96,240,000	96,240,000	97,840,000	99,440,000	99,440,000	99,440,000
10	% of Accounted for Water in NGWA system	%		47.6%	49.8%	51.3%	54.6%	56.2%	60.2%	64.2%	68.2%	72.2%	76.2%	76.4%	76.7%	76.9%	77.2%	77.4%	77.4%	77.4%	77.4%	77.4%	77.4%	77.4%	77.9%	78.4%	79.0%	79.5%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
11	Volume of Unnacounted For Water	m3	na	29,479,803	28,073,576	27,316,131	25,742,000	24,941,152	25,312,800	26,957,400	23,945,400	29,273,400	25,061,400	24,808,680	24,555,960	24,303,240	24,050,520	23,797,800	23,797,800	23,797,800	26,057,800	26,057,800	26,057,800	25,458,240	24,858,680	24,259,120	24,685,560	24,060,000	24,060,000	24,460,000	24,860,000	24,860,000	24,860,000
12	% Unnacounted due to "Physical Losses"	%			25.2%	24.4%	22.7%	21.9%	19.9%	17.9%	15.9%	13.9%	11.9%	11.8%	11.7%	11.5%	11.4%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.0%	10.8%	10.5%	10.3%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
13	% Unnacounted due to " Administrative Losses"	%			25.1%	24.4%	22.7%	21.9%	19.9%	17.9%	15.9%	13.9%	11.9%	11.8%	11.7%	11.5%	11.4%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.0%	10.8%	10.5%	10.3%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
	SYSTEM-WIDE ANNUAL O&M COST																																
14	Salaries & Wages	JD	4,902,086	4,965,255	4,760,475	5,178,076	5,436,980	5,708,829	5,994,270	6,293,984	6,608,683	6,939,117	7,147,291	7,361,709	7,582,561	7,810,037	8,044,339	8,285,669	8,534,239	8,790,266	9,053,974	9,325,593	9,605,361	9,893,522	10,190,327	10,496,037	10,810,918	11,135,246	11,469,303	11,813,382	12,167,784	12,532,817	12,908,802
15	O&M Expenses, Excluding Electricity	JD	2,044,772	2,127,551	2,396,189	2,603,829	2,603,829	2,603,829	2,854,084	3,292,025	2,904,229	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,455,414	4,455,414	4,455,414	4,455,414	4,455,414	4,455,414	4,649,313	4,649,313	4,649,313	4,726,872	4,804,431	4,804,431	4,804,431
16	Electricity Cost @ 38 fils/kwh; 62 fils in 2009	JD	7,110,987	7,036,271	7,513,543	7,990,208	7,990,208	7,990,208	8,758,151	10,102,032	10,102,032	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	22,307,033	22,307,033	22,307,033	22,307,033	22,307,033	22,307,033	23,277,828	23,277,828	23,277,828	23,666,146	24,054,464	24,054,464	24,054,464
17	Electricity Cost for Wells, 46% of total					3,676,635	3,676,635	3,676,635	4,028,749	4,646,935	4,646,935	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	10,261,235	10,261,235	10,261,235	10,261,235	10,261,235	10,261,235	10,707,801	10,707,801	10,707,801	10,886,427	11,065,054	11,065,054	11,065,054
18	Electricity Cost for Pump Stations, 54% of total					4,313,573	4,313,573	4,313,573	4,729,401	5,455,097	5,455,097	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	12,045,798	12,045,798	12,045,798	12,045,798	12,045,798	12,045,798	12,570,027	12,570,027	12,570,027	12,779,719	12,989,411	12,989,411	12,989,411
19	Administrative Expenses (3% increase)	JD	189,204	217,265	285,284	266,703	274,704	282,945	291,434	300,177	309,182	318,457	328,011	337,851	347,987	358,427	369,179	380,255	391,662	403,412	415,515	427,980	440,819	454,044	467,665	481,695	496,146	511,031	526,361	542,152	558,417	575,169	592,424
20	Purchase of Imported Water	JD	169,359	319,915	40,026	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599
21	Cost Savings, % of Previous Year	%			0.0%	0.0%	0.0%	4.0%	5.0%	5.0%	6.0%		4.0%	6.0%	8.0%	10.0%																		
22	Wages, Materials etc. with Savings	JD	14,416,408	14,666,257	14,995,517	16,078,415	16,345,320	15,960,394	16,359,034	17,352,100	16,258,777	25,841,611	24,978,174	23,644,298	21,908,932	19,862,816	20,011,937	20,165,531	20,323,733	20,486,681	22,071,998	22,244,870	22,422,928	22,606,327	22,795,228	22,989,797	23,898,943	24,105,361	24,317,971	24,820,455	25,329,510	25,561,835	25,801,129
23	Taxes	JD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	Write-off of Accumulated Arrears	JD					684,949	680,406	699,440	537,310	441,015	307,830	159,118	164,502	169,637	174,941	180,418	186,077	191,922	197,390	203,027	208,840	214,835	221,017	226,805	232,767	238,908	245,235	251,755	257,881	264,189	270,687	277,381
25	Total Annual O&M Cost (incl. Savings)	JD	14,416,408	14,666,257	14,995,517	16,078,415	17,030,269	16,640,800	17,058,474	17,889,410	16,699,792	26,149,440	25,137,292	23,808,800	22,078,570	20,037,757	20,192,355	20,351,608	20,515,655	20,684,071	22,275,026	22,453,710	22,637,762	22,827,344	23,022,034	23,222,564	24,137,851	24,350,595	24,569,725	25,078,336	25,593,699	25,832,522	26,078,510
	NGWA REVENUES																																
26	Water sales to customers inlc tarriff increase	JD	6,593,531	6,849,145	6,504,413	7,767,600	7,949,362	8,216,731	8,493,092	8,761,593	9,038,582	9,324,328	9,619,107	9,894,059	10,176,871	10,467,767	10,766,977	11,074,741	11,353,271	11,638,805	11,931,521	12,231,599	12,539,224	12,815,325	13,097,505	13,385,899	13,680,644	13,981,878	14,250,204	14,523,680	14,802,403	15,086,476	15,376,001
27	Sewerage and drainage fees (5%/yr)	JD	662,178	826,172	861,774	957,785	1,005,674	1,055,958	1,108,756	1,164,194	1,222,403	1,283,524	1,347,700	1,415,085	1,485,839	1,560,131	1,638,137	1,720,044	1,806,046	1,896,349	1,991,166	2,090,725	2,195,261	2,305,024	2,420,275	2,541,289	2,668,353	2,801,771	2,941,859	3,088,952	3,243,400	3,405,570	3,575,848
28	Water Sales by Tankers	JD	103,549	128,828	151,427	273,588																											
29	Revenue from Exported Water	JD	1,454,332	1,609,777	1,358,532	1,250,619	1,200,279	1,166,718	1,144,345	1,099,598	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	Revenue from Water Sales to Agriculture	JD	15,348	13,602	13,428	10,606																											
31	Total Billing to Customers	JD	8,828,938	9,427,524	8,889,574	10,260,198	10,155,315	10,439,407	10,746,193	11,025,384	10,260,985	10,607,851	10,966,807	11,309,144	11,662,710	12,027,898	12,405,115	12,794,785	13,159,317	13,535,154	13,922,687	14,322,324	14,734,484	15,120,349	15,517,780	15,927,188	16,348,997	16,783,649	17,192,063	17,612,632	18,045,803	18,492,046	18,951,849
32	Collections, % of Total Billing	%	23.2%	31.1%	33.2%	33.2%	33.0%	33.0%	50.0%	60.0%	70.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%
33	Total Collections for Water	JD	2,049,962	2,931,064	2,955,082	3,410,706	3,351,254	3,445,004	5,373,096	6,615,231	7,182,690	9,016,673	9,321,786	9,612,772	9,913,304	10,223,713	10,544,348	10,875,567	11,185,419	11,504,881	11,834,284	12,173,975	12,524,312	12,852,296	13,190,113	13,538,110	13,896,647	14,266,101	14,613,254	14,970,737	15,338,933	15,718,239	16,109,072
34	Current-Year Arrears	JD	6,778,976	6,496,460	5,934,492	6,849,492	6,804,061	6,994,403	5,373,096	4,410,154	3,078,296	1,591,178	1,645,021	1,696,372	1,749,407	1,804,185	1,860,767	1,919,218	1,973,898	2,030,273	2,088,403	2,148,349	2,210,173	2,268,052	2,327,667	2,389,078	2,452,350	2,517,547	2,578,809	2,641,895	2,706,871	2,773,807	2,842,777
35	Revenue from Prior Years Arrears	JD					342,475	340,203	349,720	268,655	220,508	153,915	79,559	82,251	84,819	87,470	90,209	93,038	95,961	98,695	101,514	104,420	107,417	110,509	113,403	116,383	119,454	122,617	125,877	128,940	132,095	135,344	138,690
36	Subscribers' meter fees (3%)	JD	178,730	189,092	195,081	199,369	205,350	211,511	217,856	224,392	231,123	238,057	245,199	252,555	260,131	267,935	275,973	284,253	292,780	301,564	310,610	319,929	329,527	339,412	349,595	360,083	370,885	382,012	393,472	405,276	417,434	429,957	442,856
37	Non-Operating Revenues (3%)	JD	837,901	1,311,685	1,275,716	1,313,987	1,353,407	1,394,009	1,435,830	1,478,904	1,523,272	1,568,970	1,616,039	1,664,520	1,714,456	1,765,889	1,818,866	1,873,432	1,929,635	1,987,524	2,047,150	2,108,564	2,171,821	2,236,976	2,304,085	2,373,208	2,444,404	2,517,736	2,593,268	2,671,066	2,751,198	2,833,734	2,918,746
38	Tariff Increases In Year	%						1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
39	Total Annual Revenue		3,066,593	4,431,841	4,425,879	4,924,063	5,252,486	5,390,727	7,376,502	8,587,182	9,157,592	10,977,615	11,262,582	11,612,098	11,972,709	12,345,008	12,729,396	13,126,290	13,503,795	13,892,663	14,293,558	14,706,888	15,133,077	15,539,193	15,957,196	16,387,783	16,831,390	17,288,466	17,725,871	18,176,020	18,639,660	19,117,274	19,609,364
40	Subsidy Transfer from MOF	JD	4,570,839	3,737,956	4,635,146	4,304,861	5,316,197	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	Revenues from Private Contributions	JD				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	Total Actual Authority Revenue	JD	10,704,024	12,601,638	13,486,904	14,152,986	10,568,683	5,390,727	7,376,502	8,587,182	9,157,592	10,977,615	11,262,582	11,612,098	11,972,709	12,345,008	12,729,396	13,126,290	13,503,795	13,892,663	14,293,558	14,706,888	15,133,077	15,539,193	15,957,196	16,387,783	16,831,390	17,288,466	17,725,871	18,176,020	18,639,660	19,117,274	19,609,364
43	OPERATING SURPLUS, Rev. less O&M	JD	-3,712,384	-2,064,619	-1,508,613	-1,925,429	-6,461,586	-11,250,072	-9,681,972	-9,302,229	-7,542,200	-15,171,825	-13,874,710	-12,196,702	-10,105,860	-7,692,749	-7,462,959	-7,225,318	-7,011,859	-6,791,407	-7,981,468	-7,746,822	-7,504,686	-7,288,151	-7,064,838	-6,834,780	-7,306,461	-7,062,129	-6,843,854	-6,902,317	-6,954,039	-6,715,247	-6,469,146
44	SURPLUS AVAIL FOR SELF FINANCE	JD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	COSTS OF CAPITAL PROJECTS, from feasibility study																																
45	King Abdullah Canal Supply	JD						2,340,426	6,618,793	0	0	0	0	0	0	0	0	0	0	0	0												
46	Aqeb-Zatary Wells Supply	JD						0	12,765,957	7,030,492	0	0	0	0	0	0	0	0	0	0	0												
47	Al Wehdeh Dam Supply	JD						0	2,624,113	6,028,369	23,404,255	3,635,942	0	0	0	0	0	0	0	0	0												
48	Trans/Dist. Subsystems	JD						0	11,514,518	23,029,036	23,029,036	23,029,036	14,634,428	14,634,428	14,634,428	15,528,162	15,528,162	15,528,162	0	0	0												
49	Corridor Wells Supply	JD						0	0	0	0	0	0	0	0	0	0	0	0	4,184,397	620,715												
50	Total	JD						2,340,426	33,523,382	36,087,897	46,433,291	26,664,978	14,634,428	14,634,428	14,634,428	15,528,162	15,528,162	15,528,162	0	4,184,397	620,715	0	0	0	0	0	0	0	0	0	0	0	0
	O&M COSTS FOR CAPITAL PROJECTS																																
51	King Abdullah Canal Supply	JD						0	0	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820
52	Al Wehdeh Dam Supply	JD						0	0	0	0	2,775,385	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770
53	Pump Stations	JD						0	0	758,953	1,698,498	3,945,593	5,119,953	5,866,364	6,612,774	7,359,185	8,151,179	8,943,173	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167
54	Total	JD						0	0	1,482,773	2,422,318	7,444,799	11,394,544	12,140,954	12,887,365	13,633,775	14,425,769	15,217,764	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758
55	TOTAL SURPLUS, Op. Surplus less Project Costs	JD	-3,712,384	-2,064,619	-1,508,613	-1,925,429	-6,461,586	-13,590,498	-43,205,354	-46,872,899	-56,397,810	-49,281,602	-39,903,681	-38,972,084	-37,627,653	-36,854,687	-37,416,891	-37,971,244	-23,021,617	-26,985,562	-24,611,940	-23,756,580	-23,514,444	-23,297,909	-23,074,596	-22,844,538	-23,316,219	-23,071,887	-22,853,612	-22,912,075	-22,963,797	-22,725,005	-22,478,903
	Unit O&M Cost = (Current+New O&M Costs)/Volume Billed	JD/m3	0.57	0.54	0.54	0.56	0.55	0.52	0.45	0.40	0.37	0.44	0.46	0.45	0.43	0.42	0.43	0.44	0.45	0.45	0.43	0.43	0.43	0.43	0.43	0.43	0.42	0.42	0.42	0.42	0.42	0.42	0.42
	Total Unit Cost = (O&M+Cap Financing Cost)/Volume Billed	JD/m3	0.57	0.54	0.54	0.56	0.55	0.53	0.56	0.59	0.71	0.75	0.80	0.83	0.83	0.83	0.86	0.89	0.89	0.89	0.81	0.79	0.76	0.71	0.65	0.59	0.54	0.51	0.50	0.48	0.46	0.44	0.43
	ASSUMED FINANCING OF CAPITAL COSTS		FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
56	AMOUNT BORROWED*	US$1000						3,500	50,000	55,000	65,000	42,000	20,000	20,000	20,000	20,000	24,000	24,000	24,000														
57	Principal Amount Owed at beginning of Year	US $					0	3,500,000	53,500,000	108,500,000	173,230,769	211,115,385	222,769,231	229,423,077	232,846,154	238,730,769	243,076,923	245,884,615	222,846,154	203,961,538	179,730,769	153,000,000	125,807,692	98,692,308	75,423,077	56,384,615	42,346,154	31,538,462	22,269,231	14,538,462	8,346,154	4,000,000	1,500,000
58	Yearly Interest payment at 12% per year	JD					0	294,000	4,494,000	9,114,000	14,551,385	17,733,692	18,712,615	19,271,538	19,559,077	20,053,385	20,418,462	20,654,308	18,719,077	17,132,769	15,097,385	12,852,000	10,567,846	8,290,154	6,335,538	4,736,308	3,557,077	2,649,231	1,870,615	1,221,231	701,077	336,000	126,000
59	Yearly Principal payment	JD					0	0	0	188,462	2,880,769	5,842,308	9,342,308	11,603,846	12,680,769	13,757,692	14,834,615	16,126,923	17,419,231	18,711,538	18,711,538	19,034,615	18,980,769	16,288,462	13,326,923	9,826,923	7,565,385	6,488,462	5,411,538	4,334,615	3,042,308	1,750,000	457,692
60	Total Payment on Principal & Interest	JD					0	294,000	4,494,000	9,302,462	17,432,154	23,576,000	28,054,923	30,875,385	32,239,846	33,811,077	35,253,077	36,781,231	36,138,308	35,844,308	33,808,923	31,886,615	29,548,615	24,578,615	19,662,462	14,563,231	11,122,462	9,137,692	7,282,154	5,555,846	3,743,385	2,086,000	583,692
58	TOTAL SURPLUS, after Capital Finance	JD					-6,461,586	-11,544,072	-14,175,972	-18,604,690	-24,974,354	-38,747,825	-41,929,633	-43,072,087	-42,345,707	-41,503,826	-42,716,036	-44,006,548	-43,150,167	-42,635,715	-41,790,391	-39,633,438	-37,053,301	-31,866,767	-26,727,299	-21,398,011	-18,428,922	-16,199,822	-14,126,008	-12,458,163	-10,697,424	-8,801,247	-7,052,838

*Assume new borrowings is on commercial terms - 2yr grace on Principal, 15 yr. Repayment and 12% interes

Table L-3 EFFICIENT OPERATIONS, FINANCING BY 70% GRANTS AND 30% SOFT LOANS

			Historical Data	Historical Data	Audited Accounts	Budget Actual	Projections For Fiscal Year Shown																										
		UNITS	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
	SYSTEM STATISTICS																																
1	Number of Customers Listed by NGWA	No	na	na	177,085	185,591	189,934	194,378	198,927	203,184	207,532	211,973	216,509	220,493	224,550	228,682	232,890	237,175	240,732	244,343	248,009	251,729	255,505	258,545	261,622	264,735	267,885	271,073	273,540	276,029	278,541	281,076	283,634
2	Growth Rate per Table 4-2					2.34%	2.34%	2.34%	2.34%	2.14%	2.14%	2.14%	2.14%	1.84%	1.84%	1.84%	1.84%	1.84%	1.50%	1.50%	1.50%	1.50%	1.50%	1.19%	1.19%	1.19%	1.19%	1.19%	0.91%	0.91%	0.91%	0.91%	0.91%
3	No. of Customers w/Meters Listed by NGWA	No	na	na	177,085	177,085	184,366	191,646	198,927	203,184	207,532	211,973	216,509	220,493	224,550	228,682	232,890	237,175	240,732	244,343	248,009	251,729	255,505	258,545	261,622	264,735	267,885	271,073	273,540	276,029	278,541	281,076	283,634
4	Volume of Exported to other Governorates	m3	16,046,749	14,639,687	12,354,806	11,373,420	10,915,614	10,610,409	10,406,939	10,000,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Volume Imported from other Governorates	m3	619,400	517,580	413,869	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454	409,454
6	Volume Available for NGWA Customers	m3	na	56,802,165	55,839,707	56,180,257	56,638,064	56,943,268	63,600,000	75,300,000	75,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	105,300,000	115,300,000	115,300,000	115,300,000	115,300,000	115,300,000	115,300,000	115,300,000	120,300,000	120,300,000	120,300,000	122,300,000	124,300,000	124,300,000
7	Volume Produced from NGWA sources	m3	na	70,924,272	67,780,645	67,144,224	67,144,224	67,144,224	73,597,486	84,890,546	74,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	104,890,546	114,890,546	114,890,546	114,890,546	114,890,546	114,890,546	114,890,546	114,890,546	119,890,546	119,890,546	119,890,546	121,890,546	123,890,546	123,890,546	123,890,546
8	Volume Sold to NGWA Customers (WAJ)	m3	na	27,322,362	27,766,131	28,864,126	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
9	Volume Billed to Accounts (CDM Est.)	m3	25,381,206	27,041,682	27,800,000	28,792,382	30,896,064	32,002,117	38,287,200	48,342,600	51,354,600	76,026,600	80,238,600	80,491,320	80,744,040	80,996,760	81,249,480	81,502,200	81,502,200	81,502,200	89,242,200	89,242,200	89,242,200	89,841,760	90,441,320	91,040,880	95,614,440	96,240,000	96,240,000	97,840,000	99,440,000	99,440,000	99,440,000
10	% of Accounted for Water in NGWA system	%		47.6%	49.8%	51.3%	54.6%	56.2%	60.2%	64.2%	68.2%	72.2%	76.2%	76.4%	76.7%	76.9%	77.2%	77.4%	77.4%	77.4%	77.4%	77.4%	77.4%	77.4%	77.9%	78.4%	79.0%	79.5%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
11	Volume of Unnacounted For Water	m3	na	29,479,803	28,073,576	27,316,131	25,742,000	24,941,152	25,312,800	26,957,400	23,945,400	29,273,400	25,061,400	24,808,680	24,555,960	24,303,240	24,050,520	23,797,800	23,797,800	23,797,800	26,057,800	26,057,800	26,057,800	25,458,240	24,858,680	24,259,120	24,685,560	24,060,000	24,060,000	24,460,000	24,860,000	24,860,000	24,860,000
12	% Unnacounted due to "Physical Losses"	%			25.2%	24.4%	22.7%	21.9%	19.9%	17.9%	15.9%	13.9%	11.9%	11.8%	11.7%	11.5%	11.4%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.0%	10.8%	10.5%	10.3%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
13	% Unnacounted due to " Administrative Losses"	%			25.1%	24.4%	22.7%	21.9%	19.9%	17.9%	15.9%	13.9%	11.9%	11.8%	11.7%	11.5%	11.4%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.0%	10.8%	10.5%	10.3%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
	SYSTEM-WIDE ANNUAL O&M COST																																
14	Salaries & Wages	JD	4,902,086	4,965,255	4,760,475	5,178,076	5,436,980	5,708,829	5,994,270	6,293,984	6,608,683	6,939,117	7,147,291	7,361,709	7,582,561	7,810,037	8,044,339	8,285,669	8,534,239	8,790,266	9,053,974	9,325,593	9,605,361	9,893,522	10,190,327	10,496,037	10,810,918	11,135,246	11,469,303	11,813,382	12,167,784	12,532,817	12,908,802
15	O&M Expenses, Excluding Electricity	JD	2,044,772	2,127,551	2,396,189	2,603,829	2,603,829	2,603,829	2,854,084	3,292,025	2,904,229	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,067,618	4,455,414	4,455,414	4,455,414	4,455,414	4,455,414	4,455,414	4,649,313	4,649,313	4,649,313	4,726,872	4,804,431	4,804,431	4,804,431
16	Electricity Cost @ 38 fils/kwh; 62 fils in 2009	JD	7,110,987	7,036,271	7,513,543	7,990,208	7,990,208	7,990,208	8,758,151	10,102,032	10,102,032	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	20,365,443	22,307,033	22,307,033	22,307,033	22,307,033	22,307,033	22,307,033	23,277,828	23,277,828	23,277,828	23,666,146	24,054,464	24,054,464	24,054,464
17	Electricity Cost for Wells, 46% of total					3,676,635	3,676,635	3,676,635	4,028,749	4,646,935	4,646,935	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	9,368,104	10,261,235	10,261,235	10,261,235	10,261,235	10,261,235	10,261,235	10,707,801	10,707,801	10,707,801	10,886,427	11,065,054	11,065,054	11,065,054
18	Electricity Cost for Pump Stations, 54% of total					4,313,573	4,313,573	4,313,573	4,729,401	5,455,097	5,455,097	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	10,997,339	12,045,798	12,045,798	12,045,798	12,045,798	12,045,798	12,045,798	12,570,027	12,570,027	12,570,027	12,779,719	12,989,411	12,989,411	12,989,411
19	Administrative Expenses (3% increase)	JD	189,204	217,265	285,284	266,703	274,704	282,945	291,434	300,177	309,182	318,457	328,011	337,851	347,987	358,427	369,179	380,255	391,662	403,412	415,515	427,980	440,819	454,044	467,665	481,695	496,146	511,031	526,361	542,152	558,417	575,169	592,424
20	Purchase of Imported Water	JD	169,359	319,915	40,026	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599	39,599
21	Cost Savings, % of Previous Year	%			0.0%	0.0%	0.0%	4.0%	5.0%	5.0%	6.0%		4.0%	6.0%	8.0%	10.0%																		
22	Wages, Materials etc. with Savings	JD	14,416,408	14,666,257	14,995,517	16,078,415	16,345,320	15,960,394	16,359,034	17,352,100	16,258,777	25,841,611	24,978,174	23,644,298	21,908,932	19,862,816	20,011,937	20,165,531	20,323,733	20,486,681	22,071,998	22,244,870	22,422,928	22,606,327	22,795,228	22,989,797	23,898,943	24,105,361	24,317,971	24,820,455	25,329,510	25,561,835	25,801,129
23	Taxes	JD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	Write-off of Accumulated Arrears	JD					684,949	680,406	699,440	537,310	441,015	307,830	159,118	164,502	169,637	174,941	180,418	186,077	191,922	197,390	203,027	208,840	214,835	221,017	226,805	232,767	238,908	245,235	251,755	257,881	264,189	270,687	277,381
25	Total Annual O&M Cost (incl. Savings)	JD	14,416,408	14,666,257	14,995,517	16,078,415	17,030,269	16,640,800	17,058,474	17,889,410	16,699,792	26,149,440	25,137,292	23,808,800	22,078,570	20,037,757	20,192,355	20,351,608	20,515,655	20,684,071	22,275,026	22,453,710	22,637,762	22,827,344	23,022,034	23,222,564	24,137,851	24,350,595	24,569,725	25,078,336	25,593,699	25,832,522	26,078,510
	NGWA REVENUES																																
26	Water sales to customers inlc tarriff increase	JD	6,593,531	6,849,145	6,504,413	7,767,600	7,949,362	8,216,731	8,493,092	8,761,593	9,038,582	9,324,328	9,619,107	9,894,059	10,176,871	10,467,767	10,766,977	11,074,741	11,353,271	11,638,805	11,931,521	12,231,599	12,539,224	12,815,325	13,097,505	13,385,899	13,680,644	13,981,878	14,250,204	14,523,680	14,802,403	15,086,476	15,376,001
27	Sewerage and drainage fees (5%/yr)	JD	662,178	826,172	861,774	957,785	1,005,674	1,055,958	1,108,756	1,164,194	1,222,403	1,283,524	1,347,700	1,415,085	1,485,839	1,560,131	1,638,137	1,720,044	1,806,046	1,896,349	1,991,166	2,090,725	2,195,261	2,305,024	2,420,275	2,541,289	2,668,353	2,801,771	2,941,859	3,088,952	3,243,400	3,405,570	3,575,848
28	Water Sales by Tankers	JD	103,549	128,828	151,427	273,588																											
29	Revenue from Exported Water	JD	1,454,332	1,609,777	1,358,532	1,250,619	1,200,279	1,166,718	1,144,345	1,099,598	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	Revenue from Water Sales to Agriculture	JD	15,348	13,602	13,428	10,606																											
31	Total Billing to Customers	JD	8,828,938	9,427,524	8,889,574	10,260,198	10,155,315	10,439,407	10,746,193	11,025,384	10,260,985	10,607,851	10,966,807	11,309,144	11,662,710	12,027,898	12,405,115	12,794,785	13,159,317	13,535,154	13,922,687	14,322,324	14,734,484	15,120,349	15,517,780	15,927,188	16,348,997	16,783,649	17,192,063	17,612,632	18,045,803	18,492,046	18,951,849
32	Collections, % of Total Billing	%	23.2%	31.1%	33.2%	33.2%	33.0%	33.0%	50.0%	60.0%	70.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%
33	Total Collections for Water	JD	2,049,962	2,931,064	2,955,082	3,410,706	3,351,254	3,445,004	5,373,096	6,615,231	7,182,690	9,016,673	9,321,786	9,612,772	9,913,304	10,223,713	10,544,348	10,875,567	11,185,419	11,504,881	11,834,284	12,173,975	12,524,312	12,852,296	13,190,113	13,538,110	13,896,647	14,266,101	14,613,254	14,970,737	15,338,933	15,718,239	16,109,072
34	Current-Year Arrears	JD	6,778,976	6,496,460	5,934,492	6,849,492	6,804,061	6,994,403	5,373,096	4,410,154	3,078,296	1,591,178	1,645,021	1,696,372	1,749,407	1,804,185	1,860,767	1,919,218	1,973,898	2,030,273	2,088,403	2,148,349	2,210,173	2,268,052	2,327,667	2,389,078	2,452,350	2,517,547	2,578,809	2,641,895	2,706,871	2,773,807	2,842,777
35	Revenue from Prior Years Arrears	JD					342,475	340,203	349,720	268,655	220,508	153,915	79,559	82,251	84,819	87,470	90,209	93,038	95,961	98,695	101,514	104,420	107,417	110,509	113,403	116,383	119,454	122,617	125,877	128,940	132,095	135,344	138,690
36	Subscribers' meter fees (3%)	JD	178,730	189,092	195,081	199,369	205,350	211,511	217,856	224,392	231,123	238,057	245,199	252,555	260,131	267,935	275,973	284,253	292,780	301,564	310,610	319,929	329,527	339,412	349,595	360,083	370,885	382,012	393,472	405,276	417,434	429,957	442,856
37	Non-Operating Revenues (3%)	JD	837,901	1,311,685	1,275,716	1,313,987	1,353,407	1,394,009	1,435,830	1,478,904	1,523,272	1,568,970	1,616,039	1,664,520	1,714,456	1,765,889	1,818,866	1,873,432	1,929,635	1,987,524	2,047,150	2,108,564	2,171,821	2,236,976	2,304,085	2,373,208	2,444,404	2,517,736	2,593,268	2,671,066	2,751,198	2,833,734	2,918,746
38	Tariff Increases In Year	%						1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
39	Total Annual Revenue		3,066,593	4,431,841	4,425,879	4,924,063	5,252,486	5,390,727	7,376,502	8,587,182	9,157,592	10,977,615	11,262,582	11,612,098	11,972,709	12,345,008	12,729,396	13,126,290	13,503,795	13,892,663	14,293,558	14,706,888	15,133,077	15,539,193	15,957,196	16,387,783	16,831,390	17,288,466	17,725,871	18,176,020	18,639,660	19,117,274	19,609,364
40	Subsidy Transfer from MOF	JD	4,570,839	3,737,956	4,635,146	4,304,861	5,316,197	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	Revenues from Private Contributions	JD				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	Total Actual Authority Revenue	JD	10,704,024	12,601,638	13,486,904	14,152,986	10,568,683	5,390,727	7,376,502	8,587,182	9,157,592	10,977,615	11,262,582	11,612,098	11,972,709	12,345,008	12,729,396	13,126,290	13,503,795	13,892,663	14,293,558	14,706,888	15,133,077	15,539,193	15,957,196	16,387,783	16,831,390	17,288,466	17,725,871	18,176,020	18,639,660	19,117,274	19,609,364
43	OPERATING SURPLUS, Rev. less O&M	JD	-3,712,384	-2,064,619	-1,508,613	-1,925,429	-6,461,586	-11,250,072	-9,681,972	-9,302,229	-7,542,200	-15,171,825	-13,874,710	-12,196,702	-10,105,860	-7,692,749	-7,462,959	-7,225,318	-7,011,859	-6,791,407	-7,981,468	-7,746,822	-7,504,686	-7,288,151	-7,064,838	-6,834,780	-7,306,461	-7,062,129	-6,843,854	-6,902,317	-6,954,039	-6,715,247	-6,469,146
44	SURPLUS AVAIL FOR SELF FINANCE	JD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	COSTS OF CAPITAL PROJECTS, from feasibility study																																
45	King Abdullah Canal Supply	JD						2,340,426	6,618,793	0	0	0	0	0	0	0	0	0	0	0	0												
46	Aqeb-Zatary Wells Supply	JD						0	12,765,957	7,030,492	0	0	0	0	0	0	0	0	0	0	0												
47	Al Wehdeh Dam Supply	JD						0	2,624,113	6,028,369	23,404,255	3,635,942	0	0	0	0	0	0	0	0	0												
48	Trans/Dist. Subsystems	JD						0	11,514,518	23,029,036	23,029,036	23,029,036	14,634,428	14,634,428	14,634,428	15,528,162	15,528,162	15,528,162	0	0	0												
49	Corridor Wells Supply	JD						0	0	0	0	0	0	0	0	0	0	0	0	4,184,397	620,715												
50	Total	JD						2,340,426	33,523,382	36,087,897	46,433,291	26,664,978	14,634,428	14,634,428	14,634,428	15,528,162	15,528,162	15,528,162	0	4,184,397	620,715	0	0	0	0	0	0	0	0	0	0	0	0
	O&M COSTS FOR CAPITAL PROJECTS																																
51	King Abdullah Canal Supply	JD						0	0	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820	723,820
52	Al Wehdeh Dam Supply	JD						0	0	0	0	2,775,385	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770	5,550,770
53	Pump Stations	JD						0	0	758,953	1,698,498	3,945,593	5,119,953	5,866,364	6,612,774	7,359,185	8,151,179	8,943,173	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167	9,735,167
54	Total	JD						0	0	1,482,773	2,422,318	7,444,799	11,394,544	12,140,954	12,887,365	13,633,775	14,425,769	15,217,764	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758	16,009,758
55	TOTAL SURPLUS, Op. Surplus less Project Costs	JD	-3,712,384	-2,064,619	-1,508,613	-1,925,429	-6,461,586	-13,590,498	-43,205,354	-46,872,899	-56,397,810	-49,281,602	-39,903,681	-38,972,084	-37,627,653	-36,854,687	-37,416,891	-37,971,244	-23,021,617	-26,985,562	-24,611,940	-23,756,580	-23,514,444	-23,297,909	-23,074,596	-22,844,538	-23,316,219	-23,071,887	-22,853,612	-22,912,075	-22,963,797	-22,725,005	-22,478,903
	Unit O&M Cost = (Current+New O&M Costs)/Volume Billed	JD/m3	0.57	0.54	0.54	0.56	0.55	0.52	0.45	0.40	0.37	0.44	0.46	0.45	0.43	0.42	0.43	0.44	0.45	0.45	0.43	0.43	0.43	0.43	0.43	0.43	0.42	0.42	0.42	0.42	0.42	0.42	0.42
	Total Unit Cost = (O&M+Cap Financing Cost)/Volume Billed	JD/m3	0.57	0.54	0.54	0.56	0.55	0.52	0.45	0.41	0.39	0.45	0.47	0.47	0.46	0.45	0.46	0.48	0.49	0.49	0.47	0.48	0.48	0.48	0.48	0.47	0.46	0.46	0.46	0.46	0.46	0.46	0.46
	ASSUMED FINANCING OF CAPITAL COSTS		FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
53	AMOUNT BORROWED*	US$1000						1,050	15,000	16,500	19,500	12,600	6,000	6,000	6,000	7,200	7,200	7,200		1,800	750												
54	Principal Amount Owed at beginning of Year	US $					0	29,817,544	31,750,250	34,115,022	35,016,192	40,607,643	41,665,927	42,866,054	44,111,801	45,404,938	47,402,584	48,751,312	50,273,122	51,855,421	50,421,703	52,132,498	53,911,397	55,761,305	57,685,078	59,685,736	62,040,127	64,204,124	66,454,843	68,905,319	71,449,779	73,982,601	76,501,041
55	Yearly Interest payment at 12% per year	JD					0	14,700	224,700	455,700	728,700	905,100	989,100	1,072,512	1,147,524	1,230,096	1,301,748	1,366,344	1,326,780	1,309,056	1,273,272	1,222,956	1,168,608	1,110,228	1,051,848	992,460	932,652	872,844	813,036	753,228	693,420	633,612	573,804
56	Yearly Principal payment	JD					0			0	0	0	29,400	449,400	911,400	1,457,400	1,810,200	1,978,200	2,146,200	2,314,200	2,515,800	2,717,400	2,919,000	2,919,000	2,969,400	2,990,400	2,990,400	2,990,400	2,990,400	2,990,400	2,990,400	2,990,400	2,990,400
60	Total Payment on Principal & Interest	JD					0	14,700	224,700	455,700	728,700	905,100	1,018,500	1,521,912	2,058,924	2,687,496	3,111,948	3,344,544	3,472,980	3,623,256	3,789,072	3,940,356	4,087,608	4,029,228	4,021,248	3,982,860	3,923,052	3,863,244	3,803,436	3,743,628	3,683,820	3,624,012	3,564,204
58	TOTAL SURPLUS, after Capital Finance	JD					-6,461,586	-11,264,772	-9,906,672	-9,757,929	-8,270,900	-16,076,925	-14,893,210	-13,718,614	-12,164,784	-10,380,245	-10,574,907	-10,569,862	-10,484,839	-10,414,663	-11,770,540	-11,687,178	-11,592,294	-11,317,379	-11,086,086	-10,817,640	-11,229,513	-10,925,373	-10,647,290	-10,645,945	-10,637,859	-10,339,259	-10,033,350

*Assume new borrowings is on KfW terms - 5yr grace on Principal, 30 yr. Repayment and 2% interes